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EDITED BY

C. STANILAND WAKE.

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PREFACE.

THE International Congress of Anthropology formed one of the series of Congresses held at Chicago, in the year 1893, under the auspices of the World's Congress Auxiliary of the World's Columbian Exposition. To give it a fully representative character, however, it was thought advisable to enlist in the work of the Congress the co-operation of the leading scientific societies of the United States, interested in the study of Anthropology. With this object, in addition to the local Committee of Organization, an Executive Committee was appointed, the members of which represented, not only the Congress Auxiliary, but also the American Association for the Advancement of Science, the American Folk-lore Society, the Anthropological Society of Washington, the Women's Anthropological Society, and the United States Army Medical Museum.

The first meeting of the Congress of Anthropology, under the presidency of Dr. Daniel G. Brinton, was held August 28th, 1893, at the Memorial Art Institute, Chicago, after addresses of welcome had been made by the Honorable Charles C. Bonney, the President of the Congress Auxiliary, and others. The subsequent meetings of the Congress, which continued until September 2nd, 1893, were held on the grounds of the World's Columbian Exposition, so as to be within reach of the Anthropological and Ethnological collections in the Anthropological Building, under the charge of Professor F. W. Putnam, Chief of the Department of Ethnology, and of the illustrations of American Ethnology in the Government Building, besides the numerous detached collections of objects which afforded so abundant a supply of material for Anthropological study at the Exposition. In this connection should be mentioned the Midway Plaisance, where were gathered representatives of most of the Oriental peoples, inclu-

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sive of natives from several of the Pacific Islands, as well as of various European nationalities.

The papers brought before the Congress were classified under the heads of Physical Anthropology, Archæology, Ethnology, Folk-lore, Religions and Linguistics. In addition to the papers read, and to the Introductory Address by the President, Dr. Daniel G. Brinton, addresses were given by Dr. Franz Boas, Professor Henry H. Donaldson and Professor Joseph Jastrow, on the Anthropological Laboratories of the Department of Ethnology; by Mr. Stewart Culin, Captain J. A. Bourke, United States Army, and Mr. Frank Hamilton Cushing, on the Collection of Games in the Anthropological Building; by Professor F. W. Putnam, on North American Archæology; by Professor Otis T. Mason, on North American Ethnology; by Mr. Frank Hamilton Cushing, on "A Zuni Dramatic Ceremonial," and on "The Cliff-Dwellers;" by Mrs. M. French-Sheldon, on "Customs among Nations of East Africa;" and by Dr. Ulrich Jahn, on the Ethnological Collection in the German Village on the Midway Plaisance.

In addition to those here published, the following papers were read before the Congress:

Trepanning in Ancient Peru. By Manuel A. Muniz.

The Mexican Calendar System. By Mrs. Zelia Nuttall.

A Peculiar Observance of the Quichua Indians of Peru. By G. A. Dorsey.

The Walpi Flute Observance: A Study of Tusuyan Ceremonial. By L. Walter Fewkes.

Notes on the Phonology of the Kootenay Indian Language. By A. F. Chamberlain.

Study of the Paquina Language of Central America. By Raoul de la Grasserie.

The paper by Mrs. Zelia Nuttall, on "The Mexican Calendar System," is about to be published in an extended form by the Peabody Museum, Harvard University, Cambridge, Mass., accompanied by the elaborate tables showing the reconstruction of the Calendar with which it was illustrated.

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An arrangement has been made with Mr. Frank Hamilton Cushing whereby the Bureau of American Ethnology, Washington, D. C., will undertake the publication in its forthcoming Annual Report of a Memoir by himself and Mr. Stewart Culin, on Divination and Games. This Memoir will consist of the addresses presented before the Congress by Messrs. Cushing and Culin on the series of games exhibited in the Anthropological Building, greatly extended, and will be illustrated with both text cuts and colored plates. As the Reports of the Bureau of American Ethnology are widely distributed among Ethnologists, it is probable that a copy of the volume containing this Memoir will reach nearly every subscriber to these Proceedings. Any subscriber who does not receive it, however, and any registered member of the Congress will be able to obtain a copy on application to the Bureau.

It is also probable that the other addresses presented before the Congress by Mr. Cushing, on the Dramatic Ceremonial of the Zuni, and on the Cliff-Dwellers and their place in Pueblo History and Culture, will be published later by the same office, and may likewise be made available to members of the Congress.

The study of the Paquina Language by M. Raoul de la Grasserie has already appeared in France as a separate publication.

The following pamphlets were presented by the authors to be laid before the Congress:

PROF. ADOLF BASTIAN. (1) "Die Verbleibs-Orte der abgeschiedenen Seele. Ein Vortrag in erweiterter Umarbeitung."
(2) "Der Buddhismus als religions-philosophisches System."

LE BARON DE BAYE. (1) "Souvenir de Congrès internationale d' Anthropologie et d' Archéologie prehistorique." Moscou, 1892.
(2) "Le Congrès internationale d' Anthropologie et d' Archeologie prehistorique" de Moscou en 1892.

GENERAL J. G. R. FORLONG. "The Two Stages in Buddha's Teaching."

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M. F. GAILLARD.	"Inventaire avec Cartes des Monuments mégalithiques du Morbihan." [Revue des Sciences Naturelles de l' Ouest.]
MR. J. PARK HARRISON.	"On a Glass Necklace from Arica in the Pitt-Rivers Museum at Oxford."
PROF. ALOIS RAIMUND HEIN.	"Mæander, Kreuze, Hakenkreuze und urmotivische Wirbelornamente in Amerika."
DR. G. KLEINSCHMIDT.	"Zwei Lemnische Inschriften."
DR. G. W. LEITNER.	(1) "The Kelam-I-Pir and Esoteric Muhammadanism."
	(2) "A Secret Religion in the Hindukush [the Pamir region] and in the Lebanon."
	(3) "Anthropological Observations on the Dards and Kafirs in Dr. Leitner's Service" (with Portraits).
MR. A. L. LEWIS.	(1) "Stone Circles of Britain."
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TABLE OF CONTENTS.

PAGE

PRESIDENTIAL ADDRESS.

1. The "Nation" as an Element in Anthropology. By Daniel G. Brinton, ... 19

PHYSICAL ANTHROPOLOGY.

2. The Anthropology of the North American Indian. By Franz Boas, 37
3. The Anthropometry of American School Children. By Gerald M. West, ... 50

ARCHÆOLOGY.

4. The Discovery of an Artificially Flaked Flint Specimen in the Quaternary Gravels of San Isidro, Spain. By H. C. Mercer. Illustrated, - - - - - - - - - 61
5. Aboriginal American Mechanics. A Study in the History of Technography. By Otis T. Mason, ... 69
6. Archæological Researches in the Champlain Valley. By G. H. Perkins, ... 84
7. Anthropological Work at the University of Michigan. By Harlan I. Smith, ... 92
8. The Antiquity of the Civilization of Peru. By Emilio Montes, . 95
9. Cave-Dwellers of the Sierra Madre. By Carl Lumholtz, . 100
10. Orientation. By A. L. Lewis, ... 113
11. The Tumuli of Hampshire as a Central Group of the Tumuli of Britain. By John S. Phené. [Abstract], - - . 117
12. Natural History of Flaked Stone Implements. By. W. H. Holmes. Illustrated, ... 120
13. Cache Finds from Ancient Village Sites in New Jersey. By Ernest Volk. Illustrated, ... 140

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ETHNOLOGY.

14. On Various Supposed Relations between the American and Asian Races. By D. G. Brinton, ... 145
15 Bark Cloth. By Walter Hough. [Abstract], . . . 152
16. Love Songs Among the Omaha Indians. By Alice C. Fletcher, . 153
17. Primitive Scales and Rhythms. By John Comfort Fillmore. Illustrated, ... 158
18. Secret Societies and Sacred Mysteries. By Stephen D. Peet, . 176
19. Observations Among the Cameroon Tribes of West Central Africa. By C. H. Richardson, ... 199
20. Ethnological Exhibit of the Smithsonian Institution at the World's Columbian Exposition. By Otis T. Mason, . . 208
21. The Germ of Shore-Land Pottery. An Experimental Study. By Frank Hamilton Cushing. Illustrated. 217

FOLK-LORE.

22. Ritual Regarded as the Dramatization of Myth. By William Wells Newell, ... 237
23. Some Illustrations of the Connection between Myth and Ceremony. By Washington Matthews, ... 246
24. The Fall of Hochelaga. A Study of Popular Tradition. By Horatio Hale, - - - - - - - - - 252
25. Folk-Lore of Precious Stones. By George Frederick Kunz, . 267
26. The Coyote and the Owl. (Tales of the Kootenay Indians.) By A. F. Chamberlain, ... 282

RELIGIONS.

27. The Scope and Method of the Historical Study of Religions. By Morris Jastrow, Jr., ... 287
28. An Ancient Egyptian Rite Illustrating a Phase of Primitive Thought. By Sara Y. Stevenson, ... 298
29. A Chapter of Zuni Mythology. By Matilda C. Stevenson, . 312
30. The Religious Symbolism of Central America and its Wide Distribution. By Francis Parry. [Abstract], . . . 320
31. Museum Collections to Illustrate Religious History and Ceremonials. By Cyrus Adler, ... 322

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LINGUISTICS.

32. The Present Status of American Linguistics. By Daniel G. Brinton. [Abstract], ... 335

33. Classification of the Languages of the North Pacific Coast. By Franz Boas, ... 339

SUPPLEMENTARY.

GERMAN PAPERS.

34. Die Bewohner des Gran Chaco, Paraguay. Von Emil Hassler, . 349

35. Vilen als Heilkundige im Volkglauben der Suedslaven. Von Dr. Friedrich S. Krauss, ... 367

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THE CONGRESS OF ANTHROPOLOGY.

ADDRESS BY THE PRESIDENT.

THE "NATION" AS AN ELEMENT IN ANTHROPOLOGY.

BY DR. DANIEL G. BRINTON.

THE subject which I bring before you is one which I have selected in order to impress upon you forcibly the true breadth and full meaning of the science toward the cultivation of which we have assembled at this time.

There is no other word which so thoroughly expresses the purpose of this branch of learning as that which we have adopted—Anthropology, the Science of Man, the study of the nature of man, the search for and correct expression of those laws, and all the laws, which govern the birth, growth, development and decay of all his traits, powers and faculties.

Anthropology means this, and nothing less than this. Its motto is that of the character in the Terentian drama—

"Homo sum, humani nihil a me alienum puto."

It embraces everything and excludes nothing which pertains to humanity, whether in the individual or in his various aggregations. It omits no part or function of him as unworthy of its notice; it admits the existence of none so superior or sacred as to be beyond the pale of its investigations. The field which it goes forth to reap is the World, and its harvest-season covers all time since man first set foot upon it.

It is signally unfortunate that the full connotation of the term has not been constantly present in the minds of those who have pursued the science. We should not then have witnessed the cheerless spectacle of one school of anthropologists claiming that man is nothing more than the highest mammal, and that the study of his anatomical and physiological relations exhausts the definition of their science, and that those who go beyond these are merely "historians and men of letters;" or that of another school, which, disregarding the incalculable potency of man's physical conditions, seeks to erect the science exclusively on

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the basis of the products of the mental faculties, his arts, institutions, religions and languages.

Each is equally in error. No correct and comprehensive idea can be formed of the various elements which have rendered man what he is, or any race or stock of men what it is, unless all these phenomena receive due consideration, and the various agencies which influence them are weighed with impartial fairness. The historian must become an anatomist, the anatomist a linguist, if he would reach positive results in this study.

You observe that the programme of this Congress includes Physical Anthropology, Archæology, Ethnology, Folk-lore, Religions and Linguistics. It would be an epoch in the history of the science, a notable era in its development, if the labors we are about to enter upon should lastingly impress on all who pursue this branch that every one of these departments is equally important, that not one of them can be neglected or overlooked, that the richest in results is still but *primus inter pares*, a brother among brethren.

To illustrate how closely the multitudinous influences which they represent are woven together, and how each bears upon the whole nature of man, I shall consider with brevity in what manner that entity which we call a "Nation" appears as an element in anthropology. I have been partly, though by no means wholly, led to make this selection because this particular question has been much misunderstood in some quarters and its bearings misconceived. As late as at the congress at Moscow last year, a distinguished writer on our branch of science said, "Nationality has nothing to do with anthropology. It is a product of history and concerns history only."

So far from this being correct, I shall endeavor to show that nationality has ever been and is to-day an agent more powerful in modifying both the physical and the psychical elements of man than either race, climate, religion or culture; and therefore that it must constantly occupy the attention of the anthropologist, whether his researches are in the purely physical or in the intellectual fields.

I desire to emphasize the fact that the anthropologist will never fully comprehend the science which he professes to follow, will never attain the preception of its whole significance, if he omits from its study, as not pertaining strictly to it, any influence whatever which bears upon and modifies in any direction the evolution of the human species. This the Nation does with a directness and a potency which cannot be misunderstood or called in question.

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Let us inquire what it is we mean by the expression "a people" or "a nation," when we use these terms as synonymous. I can find no more profound and true definition than that given by the most philosophic English poet of this century, Robert Browning, in these words:

"A people is but the attempt of many
To rise to the completer life of one."

The incompleteness and imperfectness of the life of the isolated individual, and his conscious or unconscious aspirations for completion and perfection, are the motives which have ever urged man to establish those relations with his fellows which result in what we call social ties or bonds.

Although to the superficial observer these seem to have been most heterogeneous and fortuitous, a comprehensive analysis reduces them to a very few so far as their guiding principles are concerned. Here as elsewhere in ethnology we are impressed with the paucity—yes, I may even say the poverty, of the resources which have been utilized by man in his upward march to conscious culture.

Wherever we find men united together under some form of social compact, we shall find also that this compact will fall under one of three categories. It is based upon community, either real or theoretical, of blood, of territorial area, or of purpose. These three forms are mutually incompatible; they are exclusive of and in sharp contrast with one another; they react very differently upon the individual and the race; and they belong markedly to different periods in the history of a people, to different stages of its advancement in culture.

It may be laid down as a rule with few or no exceptions that the earliest form of the social bond is one of blood, of kinship, of consanguinity and affinity. The unit of the primitive horde is the family, the one cohesive principle which it recognizes as socially binding is purity of descent, the maintenance of the integrity of the stock, as its members understand it. Here, then, we see a mighty influence at work to preserve in primitive times and conditions the unity of the physical type. The visible aim of communities in the lower stages of culture is to preserve at all costs the characteristics of the race to which they belong, and the particular traits of the variety of that race as inherited from their ancestors. This is the guiding principle of what is known as matriarchy and the custom of tracing the genealogical line through the maternal and not through the paternal ancestry. Positive certainty as to parentage must in every case be limited to

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the mother, and for that reason the female line always insures a higher probability of purity of descent.

Of course the degree with which the conservation of the type was really maintained under this system depended on the local laws or customs regarding marriage and the fidelity required of married women. It is true that in both these respects there is considerable divergence in early conditions. In some places exogamous marriages prevailed; that is, the wife must not be an acknowledged relation of the husband; more frequently, marriages must be endogamous, that is, she must be of his recognized kin; though often this again is limited, as that she must not be an offspring of the same mother, or not be within certain degrees of kinship. Reminiscences of these restrictions still prevail in civilized communities, in ths laws prohibiting the marriage of near relations, or, as in England, prohibiting marriage with a deceased wife's sister.

In spite of these limitations, which differ widely in different tribes, the general influence of the principle of consanguinity as the basis of the social compact unquestionably aided through countless ages to individualize the physical types of the human species, and thus to develop and render permanent its races and varieties as we now know them.

So powerful was this prejudice in favor of the ancestral type, that it was a general custom in primitive times to destroy at or shortly after birth any aberrant types, and to bring all into accord with the tribal idea. For instance, in certain parts of Mexico there is a tendency to congenital albinism in the native population; and before the conquest all children displaying this tendency were sacrificed to the gods before the age of puberty. Among the Papuans, when a child is born of a lighter color than the average of the tribe, it is assiduously held in the smoke of green branches until it is tanned to the proper hue. Whenever, indeed, there was any material variation from the received type, the infant was sure not to live to that period of life when he or she could transmit it to offspring; and thus a potent factor in the evolution of the species toward modified forms was absent throughout all the childhood of the human race, owing to the conditions of the prevailing social compact.

The somatologist will object to this, that in the very earliest times and within limited areas we find that a wide diversity of type prevailed. For instance, I suppose the oldest remains of the human race found up to the present have been unearthed in Western

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Europe. But these venerable relics show the existence there in remotest times and at no great distance apart—not more than a few days' walk of an active pedestrian—of men with broad heads, and others with narrow heads, with narrow faces and with wide faces, with expanded flat noses and with narrow aquiline noses, of stature below the medium and others above the medium; and we may reasonably conclude from their descendants that some were blonds with yellow hair, while others were swarthy brunettes with locks like the raven's wing. So that Professor Kollmann, who has made this subject a special study, cannot see his way clear to admit less than four different races struggling for the soil of Western Europe in prehistoric times.

Yet if we may judge from some historic data and all analogy, these ancient peoples, like all others, strove to retain in its purity the race of their ancestors by a social organization looking to that end.

Two customs prevail everywhere in primitive life which largely counteract the result of consanguine marriages; the one is adoption, the other concubinage. Usaully, in their unceasing wars, the males of conquered tribes were killed and the women taken as captives, thus introducing through the females of another line the peculiarities of their variety or race.

In some instances, however, the males were in part preserved and adopted into the clans of the conquering tribe, either as members or as slaves. In either case they led to a modification of the ascendant type.

So varied were and are the customs and rules of primitive peoples in all these respects that it would be vain to attempt to establish a formula representing the degree in which the integrity of the racial or ethnic type was maintained; but, the aim of their institutions being always and definitely this, we may be sure that they tended very positively to preserving the lineage undefiled, and to perpetuating the physical and mental traits of each community. When this did not occur, it was in contradiction to the theory of the social compact, and arose from ignorance of the natural conditions which insure perpetuity of type, or their disregard, owing to the cravings of individual appetite.

In entire contrast to all this are both the theory and the practice which we find in the next higher step in social relations, that which has for its basis a geographical or territorial concept.

In this, it is not the notion of kinship but that of country which

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is predominant. The patriot of this epoch fights no longer for his lineage, but for his land, not for his relations, but for the realm. He expresses in this the sentiment which actuates the Nation, properly so called. Consanguine governments are tribal governments; with the birth of a genuine nationality, the family, the gens, the tribe, are all doomed to disappear, and with them the modifying influences they exerted on the race.

The intervening step between the Tribe and the Nation is usually said to be the Federation, in which several tribes agree to forget their jealousies and unite in defense or offense. This condition is transitory, and I shall pass it by, in order to consider the direct influence of a Nationality on those elements of human nature which are the peculiar topics of anthropologic science.

The first object of Nationality is unity, and this in the fullest sense of the term and in all the relations of national life.

Almost the very first of its aims is physical unity. A visible contrast between the inhabitants of different areas under one rule is suggestive to the legislator of a lack of harmony in other respects. The influence of a court, or of centralization generally, has ever been to disseminate throughout the realm one standard of physical beauty, as also one of costume and deportment; and this irrespective of how many discrepant varieties go to make up the body of the nation.

In this, as in all other respects, the chief efforts of the nation through its rulers are directed toward destroying those individual and tribal traits which forms of government based on consanguinity make it their chief end to cherish.

This contrast presents itself early. We find, for instance, that the native rulers of ancient Peru, the Incas, were accustomed, as soon as they had subjugated a new province, to deport large numbers of its inhabitants to distant parts of their empire, and supply their places with inhabitants of other tribes, who had been long subject to their rule.

This plan of partial deportation and colonization was familiar to the Carthaginians, Romans and other enterprising nations of the Mediterranean Basin, and explains to a large extent the constant blending of extreme physical types which the somatologist discovers in the remains from the oldest cemeteries around that great interior sea. We know by history and tradition that the "blond Libyans," the light-haired, blue-eyed natives of Northern Africa, tall and dolichocephalic, were transported in large numbers across the sea to the north,

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and settled among the smaller, swarthy and brachycephalic tribes, whom we vaguely hear of under the names of Ligurians, Aquitanians, and Iberians.

Another physical lever which the Nation, as distinct from the Tribe, brings to bear on the physical traits of the species within its limit is its military organization. This is no longer classified by clans or gentes, but is an army, with its soldiers drawn indiscriminately from all parts of its territory, and moving indifferently into all parts, as occasion calls for. In earlier and more disturbed times, when social ethics were less regarded than to-day, the presence of large numbers of men cantoned and quartered upon the inhabitants, often exercising over them a brutal authority, led to constant commingling of race-types and the gradual extinction of local peculiarities.

The influence which the Nation as an anthropologic element exerts on language is one which demands our special attention. When it is rightly understood, much of that contest which has been going on for years between ethnographers, as to the worth or worthlessness of language as a guide in ethnography, will appear in a different light.

It is obvious that it would be consonant with the spirit of a gentile or consanguine society to preserve pertinaciously its own inherited speech, and to oppose any changes in it. But it is just as much in its spirit to desire to confine its own tongue to its own members and to look with jealousy on others than those of the true blood making use of it. Professional linguists in the American field are well acquainted with the prevailing unwillingness of the natives to give much information about their languages. They regard with suspicion and distrust inquirers into their own peculiar dialects; it is in the nature of a trespass upon private property. The federations of tribes never go so far as to attempt to establish linguistic or dialectic unity. Only incidentally and accidentally does one tongue partly encroach upon another one in this stage of society.

For this reason the linguistic classification in ethnography is a truly valuable one in all conditions of life where the consanguine rule prevails. The language is then a trustworthy guide of affiliation both exclusively and inclusively, and the instances are extremely rare, if any indeed exist, where one tribe had deliberately forced another to change its language, as the condition of entering into an alliance.

The so-called "Empire of Anahuac," in Mexico, the organization of which had not wholly emerged from the consanguine condition,

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held as conquered and tributary many tribes of different speech, but had made no effort to impose upon any of them its own sonorous and beautiful language. On the other hand, Peru, which had reached a condition of national existence, exerted constant and strong pressure, as its historian Garcilaso de la Vega assures us, to crush and extirpate all other tongues throughout its domains than the Kechua, that spoken by the Incas and their congeners. It was declared to be the official language, and there was no hope for promotion for one not familiar with it. In this respect, those enlightened rulers of the Peruvian state displayed an insight into what constitutes the very strongest bond of national unity, which we here in the United States appreciate yet but imperfectly. It is within my own memory that the Acts of Assembly of my own State were issued in two languages, thus encouraging a long-existing linguistic discrepancy between the citizens of that commonwealth. Linguistic unity is the indispensable basis of national unity. When, as is the case with one of the present European empires, we hear of thirty-six different languages being current under one rule, we may be sure there is no real coherence in the nation.

The recognition of this fact, and the steady efforts directed toward the extermination of subordinate tongues and the substitution of a general or national one in their place, has led to the phenomenon of peoples of the same descent speaking different idioms, and those of alien origin expressing themselves through one and the same medium.

It remains true, nevertheless — and this is an important point too often lost sight of in the discussion — that this substitution of one language for another never takes place without an extensive admixture of blood; for there is no more potent and prompt method of attacking the integrity of a language than by intermarriage. Indeed, except in cases of slavery, we may almost establish the formula that the admixture of blood under such circumstances bears the fixed relation of one-half to one; that is, that when a language has superseded another, one-half of the marriages in the latter have been with members of the former. Of course, by marriages in this relation we mean continued sexual unions, not necessarily legal ceremonies.

In no department of anthropology has the Nation as a formative agent exerted a more visible influence than in religion.

It is well known to you all that the primitive religion is strictly that of the gens, the family and the tribe. Some, indeed, have claimed that ancestral worship, the homage paid to the forefathers of the horde, was always the earliest expression of the religious sentiment.

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This is probably erroneous, but that it generally played a prominent part all will acknowledge. There can be no question but that, so long as the consanguine theory of social organization exists, the religion is always tribal. The god or gods which are worshiped are gods of the tribe, interesting themselves in it exclusively or mainly, espousing its cause, and defending it against the tribal enemies. It makes no difference whether the tendency of the tribal psychology is toward polytheism or monotheism, toward materiality or spirituality in its deistic conceptions, the strictly limited and tribal character of its religion will not be altered.

It was a serious error on the part of the philosopher Comte to suppose that the line of progress of religions is from animism, or, as he called it, fetichism, through polytheism to monotheism. That may be the logical, but it is not the historical, progress. A monotheism may be as narrow as the narrowest ancestral worship; the one god may be merely the god of the tribe, as was the Jehovah of the early Jews, derived, as Semitic scholars now tell us, name and all, from a local Canaanitish deity.

The real line of progress is in extension, in the conception of a supreme intelligence, who treats friend and foe with equal favor, and who governs the processes of the universe on principles which do not fit into any frame of morals or justice carved by human hands, for these are ever the product of temporary phases of growth.

To this progress the Nation as an historic entity powerfully contributed. As one tribe conquered and absorbed another, and new gods were brought in along with the new blood, it necessarily followed that their merely tribal character was lost. They were chosen as national gods, or, more generally, they fell into complete forgetfulness. Were they locally celebrated as potent auxiliaries of their worshipers, special efforts might be made to destroy their hold upon the imagination of their adherents. It is curious to observe that both in Peru and in ancient Rome the most celebrated gods of conquered tribes were carried to the capital, and there placed in a temple by themselves, where it was believed they could do no harm to the reigning powers.

It is true that the tribal character of tribal religions, inherited from father to son through so many generations, continued to make itself felt even in the minds of religious reformers and national rulers long after the Nation had exerted its dissolving potency on most which had come under its influence. Christianity was first preached

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as a tribal religion, and it was only with expressed regret that its founder, finding that it would not be received by the tribe, sought disciples outside of the line of Judah. So, in later times, and quite down to our own day, national councils and rulers express themselves with more or less of sincerity in the words of Louis XIV.: "Can God forget all that I have done for Him?"

But even fanatics and hypocrites are not utterly impervious to the logic which, in the construction of the Nation, destroys the gods of the tribe. They, too, begin sooner or later to perceive that deity is quite as much on the side of the enemy of their country as on their own, and thus that a national religion or a state church is an illogical anachronism which can be maintained only at the cost of debasing the religious sentiment and hindering its true evolution.

The greater security accompanying a firmly-established government and a more extended knowledge of natural laws also forced a change upon the conceptions of the religious sentiment.

The distinguished anthropologist Broca maintained that religion is not a proper and distinctive trait of humanity; that its sole foundations are fear and ignorance, and that, as these disappear in the onward march of intellect and the improvement of social security, all forms of religion will be discarded. Following his doctrines, MM. Hovelacque and Hervé, in their excellent text-book, *Precis d'Anthropologie*, formulate the decision: "When the human intellect attains freedom through observation and experience, it reaches atheism, that scientific form of materialism which acknowledges the existence of nothing beyond the elements of matter and the properties with which they are endowed."

Toward the destruction of all local, personal and tribal forms of religion the Nation potently contributes by declaring them in antagonism to the spirit of nationality; the security it guarantees lessens the dread of the unknown, and thus diminishes the element of fear as a basis for religion; but it is still questionable whether, if all such fear was removed, the result stated by the writers above quoted would be reached. The religious sentiment is not exclusively based on fear, and manifests itself without this prompting.

In discussing this question broadly, I shall not stop to consider the special form of government which the Nation may adopt. That is really of secondary importance, as it does not materially influence the completeness of the contrast between the spirit of the Nation, as such, and that of the tribal condition.

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Whatever the national form of government adopted, the principal maxims of jurisprudence and the ethical principles upon which they repose are profoundly modified by the substitution of the national in place of the tribal idea.

I will illustrate this contrast by an example familiar to the students of the early history of this country.

The European settlers in the colonies of Pennsylvania and New York could not understand why, when in time of peace an Indian murdered a white man, they could obtain no redress from the tribal government with whom they had treaty relations. They regarded such indolence a breach of faith and proof of evil intention. It was nothing of the kind. A crime of blood was something which concerned the consanguined gens only; it was a family matter, with which the tribal council had no concern, and about which it could take no action; it was in no sense a crime against the commonwealth.

This view of the case was something wholly incomprehensible to the Europeans, who belonged to states where a felony or a breach of the peace is an attack on the community. In other words, ethnic jurisprudence is something quite different when the Nation appears on the stage of history from what it is in the tribal condition.

This contrast runs through the whole of ethics. In a thoughtful article published some years ago in the *Zeitschrift für Ethnologie*, Dr. Kulischer pointed out that in primitive conditions ethics presents a dualistic aspect: it demands the cultivation of kindness, protection, assistance, love and peace to our friends, but quite as much does it prescribe hatred, enmity, robbery, murder and deception toward our enemy. The Nation breaks down the walls of narrow tribal animosities; it increases the number of those whose patriotic interests are in common, and thus widens the area of duty and the conceptions of ethics; but who dares say that our own conceptions of ethics are much beyond the primitive stage when still the greatest hero among us is the most skillful in murdering men, the most expert military commander?

Anything like a categorical imperative in ethics, a prescription of duty which should be the law of everyone toward all men would be out of the question in a society based on relationship or on narrow territorial considerations.

Nowhere does this ethical contrast become more apparent than in the relations of the one to the many, of the individual to the mass,

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a feature in ethnic jurisprudence admirably brought out in his recent masterly work on the subject by Dr. Albert Hermann Post.

In the tribal, totemic or consanguine condition of government the individual is not regarded as an independent unit. The obligations he has to fulfill are those of his gens, and his actions are regarded, not as his own, but as those of a member of his gens.

If he robs or murders, the punishment falls, not on him personally, but on the gens; and if blood-money or other compensation is demanded, it is not from him that it is required, but from the gens.

He, in turn, is liable for any crime his fellow-clansmen may commit; and in this vicarious expiation he sees nothing in conflict with the principles of abstract justice. He has not yet reached to the consciousness of himself as an individual. He accepts the obligations of his clan as his own, and is scarcely aware that he suffers any diminution because he can create no obligations himself otherwise than in his position as a representative of the clan or gens.

This is also true of his civil rights, and those which refer to property. Wherever the consanguine theory is in force, the communal idea of property is also active. The land belongs in part or in whole to the kith and kin, in the nature of common land, or is sub-let by the heads of the community on longer or shorter tenures. Personal property is so only in the sense that it belongs to the members of an immediate family or sub-gens, not to an individual, and in many instances passes in the female line.

It is obvious that in such a condition of society no idea of independent personal duty or individual morality could rise in the mind; and should any such enter through foreign instigation, it would be condemned as false, destructive and treasonable.

Permit me to dwell on this point with some detail because of its prime importance. Those considerations which establish in a community its moral code, its ideal standard of what is right, of conscience and of duty, pronounce the final sentence on the fate of that community. In all earlier conditions, the preservation of the gens or tribe rested more on measures of destruction than of protection. Hence, toward the alien and the stranger justice and mercy were out of place and actually prohibited. Cæsar tells us of the ancient Germans, and Nordenskjöld repeats the same of the modern Tchuktches of Siberia, that they respected no law or honesty in dealing with strangers or those alien to their tribe. To cheat such in trade, to deceive and to plunder them, was actually meritorious.

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In such communities the stranger has no rights, and can claim no protection as a fellow human being. He can only attain such through some rite of adoption into the tribe, or through some ceremony by which he can claim the privileges of hospitality, what German writers call the *Gastrecht*. The gens, the clan, the tribe, is an isolated unit, in natural antagonism to the race at large, and recognizes no sort of solidarity with its other members, nay, regards them as foes.

How different is all this in the developed system of the state? There, the individual man is held accountable for his own actions. He is considered responsible for the deeds he commits, and therefore feels that he is answerable to himself for the opinions and ethical theories which lie at the basis of his life and direct his conduct. For the first time in the history of the race, he learns the meaning of *Personality*, the highest lesson which advancing civilization can impress on humanity. He sees that by himself he must either stand or fall; that no vicarious expiation can meet the demands of what is eternally right; that his responsibility does not belong to another, nor can it be involved by the actions of another, but ever centers in his own thoughts and actions. Thus is he gradually emancipated from that condition of tutelage and hereditary bondage in which he was so long kept by the consanguine theory of government.

I cannot too strongly impress upon you that this concept of personality is a totally different condition from that of the isolated primitive man. We may imagine such an one, living alone with his one wife, his children around him, his household goods and gods all within his lonely lodge. That man's monogamy, his sense of property, his feelings of duty and responsibility, of association and independence, can in no way be assimilated to those of the man who is the free product of the state, developed through countless generations of gradual culture. To the scientific anthropologist the one is the complete contrast to the other; they have nothing in common but their external membership of the same species, and a vague resemblance of external conditions.

The individual is indeed the true purpose of the state. Its aim distinctly is that he, or she, as an individual, shall be provided with, and protected in, the greatest possible amount of personal liberty, in this being in the utmost contrast to consanguine governments; where the individual is nothing, the tribe everything.

The value of personal liberty is as a means toward the acquisition

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of personal happiness, and hence we are willing to accept the definition of the modern idea of justice as advanced by the eminent French anthropologist, Andre Lefevre—that it is the respect for every interest which contributes to the highest general happiness of humanity; and we cannot refuse to accept the definition of morality which Hovelacque and Herve offer, in their treatise above referred to, as the only one which anthropologists can recognize; that it is the principle of organization for the purpose of satisfying the physical and intellectual needs of all men; a principle which, they justly add, can only be carried out successfully by guaranteeing to the individual the highest degree of personal liberty in every direction, limited by no other barrier than the enjoyment of similar liberty by every other individual.

It is obvious on very slight reflection that the state as as element in anthropology has by no means worked out its full destiny in modifying the physical and psychical nature of man. As a form of government it is far from covering the whole of the earth's surface, and where it is nominally present it is still further in many instances from that perfected condition in which it has thrown aside the clogs and fetters of the consanguine system to which it succeeded.

Take the vast empire of China for instance. It is ruled by a foreign dynasty on general principles of statecraft. But throughout all the really Chinese portions of the empire the details of the family system are retained with wonderful tenacity.

But we need not go so far for examples. Wherever we find a system of castes or of privileged classes, an hereditary nobility or a state church, a transmissible community of property, whether real or personal, any inequality in the rights and responsibilities of sane adult individuals before the law, any concessions which relieve classes, or persons, or sects, or societies, or sexes of their full measure of liability, or confer upon them privileges or deny them rights enjoyed by others, there we are in the presence of a form of government still clinging in these respects to the primitive theories of human society. The student of ethnological jurisprudence will class it to this extent with the totemic and gentile systems of the lower and earlier strata of human development.

Let me illustrate this by the relative position of woman in a tribe and in an enlightened state. I could not touch upon a weightier question to the somatologist, for none other so intimately relates to physical anthropology.

In spite of the matriarchal system, woman in all lower conditions

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of society is treated as inferior to man and is deprived of many rights which he enjoys. The exceptions to this are extremely rare, if any really exist. The cause of her inferiority is solely her less physical powers; it has ever been because she is bodily the weaker. The forms of marriage have made no difference. Whether a man could legally take to himself a multitude of wives, or whether, as in Thibet to-day, a woman could legally take a multitude of husbands; whether she was bought openly in the matrimonial market, or whether, as in this country, she could pick and choose at will from all her admirers; whether polygamy or monogamy prevails, she has ever been treated as man's inferior, disallowed equal rights, prevented from equal liberty. So it remains to-day, though with some improvement.

At first she was but a slave and a beast of burden; at present, so far as the enjoyment of civic rights in modern states is concerned, she has risen to be classed among idiots and children. Surely we may hope that she has not yet attained the acme of her evolution.

A peculiar interest is attached to the development of this inquiry by the fact that it was originally an American contribution to our science. The first who clearly pointed out the distinction between gentile and political conditions of society, that is, between the tribe and the state, was the late Mr. Lewis H. Morgan; and, although we have been obliged materially to modify many of his opinions, to him belongs the credit of being the earliest to present in scientific form this important truth in anthropology. He did not perceive very clearly its bearings on physical anthropology, to which I have referred above, but he was fully awake to the potent agency of the state, as distinguished from the tribe, on the psychical nature of man. The following sentence from his chapter on the evolution of Greek culture will show this:

"That remarkable development of genius and intelligence which raised the Athenians to the highest eminence among the historical nations of mankind occurred after they had adopted democratic institutions, and these gave its inspiration."

By "democratic institutions" Mr. Morgan meant the substitution of a national for a tribal life.

But it would be an error to consider the state as we now know it, even in its best examples, as the final form which this element will take in molding the body and the mind of man, his aspirations and his ethical instincts. Already there are evident signs that at no very distant future the human race will outgrow the limits of Nationality

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and will demand and find some guiding principle which will break down the barriers which the Nation, under present conditions, must perforce erect around itself; which will do away with the latent hostility which now requires the maintenance of enormous military establishments, and will successfully solve the problem of absolutely conserving the rights of the individual without impairing the efficiency of the organization.

It is easy to predict from what direction and under what impulses this desirable result will be brought about. Every year is making it clearer to the eye of the attentive observer; and never anywhere or at any time has there been in the history of humanity a grander example of its growth and potency than here, at this moment, we have spread before our admiring gaze. It is by means of international action, through associations and organizations formed for international purposes, that the highest and ultimate efficiency of government will be reached; and then it will be discovered to be one with anthropology, the science of man, the discovery of the laws which will lead him to the utmost symmetrical development of all his faculties, to his maximum efficiency, to his highest happiness.

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PHYSICAL ANTHROPOLOGY.

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PHYSICAL ANTHROPOLOGY.

THE ANTHROPOLOGY OF THE NORTH AMERICAN INDIAN.

BY DR. FRANZ BOAS.

OUR knowledge of the anthropology of North America is based mainly upon the discussion of a number of important anthropological collections. First among these must be mentioned the famous Morton collection now in the possession of the Academy of Natural Sciences in Philadelphia, which forms the basis of Morton and Meigs' famous investigations. A large collection relating particularly to prehistoric American peoples has grown up in Cambridge, Mass., and the reports of the Peabody Museum contain much valuable material on our subject. Perhaps the largest collection is that of the U. S. Army Medical Museum in Washington, a published catalogue of which has made accessible a vast amount of anthropological material. But all of these data taken together have not been sufficient to delineate in a satisfactory manner the distribution of types of man in North America.

Investigations on osteological material, particularly on material collected among modern tribes, are always unsatisfactory, in that the identification of the skull, regarding its tribe and sex, often remains doubtful. Neither is it certain if we have to deal with the remains of full-blood Indians or with those of half-breeds. It appears, therefore, that for a more thorough investigation of the anthropology of North American Indians an investigation on living individuals is indispensable.

When the plans for the Department of Ethnology of the World's Columbian Exposition were being formed, Professor Putnam decided to include an investigation of the physical characteristics of the North American Indians in his work, and entrusted me with its organization. A number of young men, principally college students interested in this work, were instructed in the method of taking the observations. The material obtained through their agency has been the basis of the exhibit on the physical characteristics of the North American Indian. The material consists of measurements of about 17,000 full-blood and

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half-breed Indians which are distributed all over the North American continent with the exception of the Arctic coast and the Mackenzie Basin.

Before I begin to describe the results of this extensive inquiry I may be permitted to dwell briefly upon the leading considerations of the investigations.

The present generation of Indians is mixed to a considerable extent with whites and negroes, so much so that in certain regions it is impossible to find a full-blood individual. Thus the numerous tribes of the Iroquois, Cherokees, Chickasaws and Choctaws contain very few full-blood individuals, if any. Tribes which were once numerous and which inhabited the coast of the Atlantic Ocean have entirely disappeared, or an insignificant rest only survives. It appeared practically impossible to secure adequate data for the whole region embracing New England, the Middle States and the Southern States. On the other hand the great frequency of half-breeds among all these tribes made an investigation on these races very interesting. I decided, therefore, to pay particular attention to the question regarding the anthropology of the half-breeds. In fact, this has proved to be one of the most fruitful fields of the investigation.

In studying the characteristics of various Indian tribes as found by our observers, the question arises how to arrange them. On general principles it seemed best to consider the tribes simply as geographical groups and to treat the results also from a geographical standpoint. Following this principle, a number of tribes have been subdivided according to their present location. Thus the Ojibway, who inhabit a large part of Canada, are divided into an eastern and a western section. On the other hand groups of small tribes which inhabit the same region, and which show no differences in type, have been combined.

In order to define more clearly what is meant by a certain type, I will say that I consider the types as merely representing a series of forms found in a certain district. For convenience sake the names of the tribes among whom these types have been collected have been adopted for designating the types. I do not mean to say that the types which have been established are considered as original types of the respective peoples. The people itself may have become mixed in the course of the centuries with numerous other peoples, so much so that its original type may have disappeared entirely. There is no necessary correlation between the social unit which we call a tribe and the physical unit which constitutes the characteristics of the individuals

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of a certain region. The physical type is the result of the complex descent of a people and of the effect of the surroundings upon its physical development. It has nothing to do with the political and social organizations which we call tribes or nations. Therefore, if in the following I speak of types of the Sioux, or of Californians, it must be understood that I do not mean the types of the primitive Sioux tribe or the primitive tribes of California, but rather that I mean simply the types of the people inhabiting at present the regions occupied by the Sioux or by the Californian tribes.

It was necessary to confine the series of measurements to the most important ones, and particularly to avoid the necessity of the removal of clothing. Only by this restriction could a sufficient number of measurements be secured. It has been my endeavor to establish differences of types only in such cases where the number of cases was sufficient to show that the differences were real, not accidental. In tracing such differences it was particularly necessary to correct errors and inaccuracies of observation. In order to remedy this I have endeavored to obtain two independent series of observations on each tribe, taken by different observers and at different times. Whenever there was a reason to doubt the accuracy of an observer his returns have been excluded.

I turn now to consider the results obtained by our investigations. It is a well-known fact that the number of Indians is decreasing. This is partly due to the fact that mixed-bloods leave the tribes, but partly also to the actual reduction in numbers. It seemed of importance to know if this fact is due to the small number of births or to other causes, and also to compare the increase among half-breeds with that among full-blood Indians. For this purpose statistics have been collected regarding the number of children of Indian and half-breed women. It appears from these statistics that Indian women of more than forty years have on an average, approximately, six children, while half-breed women have on an average from seven to eight children. When the frequency of cases of women who have no children, or only two, three, four, five children, etc., are plotted, it appears that the smaller numbers of children are very much more frequent among the Indians than among the half-breeds, while the higher numbers of children are much more frequent among the half-breeds than among the Indians; that is to say, we find the rather unexpected result that the fertility among half-breed women is considerably larger than among full-blood women. The average number of children of Indian women

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is also high, and therefore the decrease in their numbers can only be explained by the fact that there exists a very high infant mortality.

In comparing the measurements of the head and of the face of Indians with those of whites we find the most striking difference to be in the dimensions of the transversal diameters of the face. On an average the breadth of face of the Indian is one centimetre more than that of the American white. It may be remarked that the face of the latter is exceedingly narrow and that in Europe, particularly in its eastern portions, we find faces which are considerably wider.

It is of interest to investigate the breadth of face of the half-breed in order to see if it stands between the measurements of the parental races, and if it is nearer the one than the other. For this purpose I have computed the breadth of face of children of full-blood Indians, half-breeds and whites from year to year, beginning with the fourth year. The tabulation shows that the difference which was noted between the adults exists just as markedly among children. The faces grow in such a way that the relation of the three groups always remains the same. The breadth of face of half-breeds stands always between that of the Indians and that of the whites, but so that it is always nearer the former. This is the case among boys as well as among girls. Thus we find the remarkable fact that at least in this one respect the half-breed is always more alike to the Indian than to the whites.

When we consider the color and structure of the hair the same fact becomes clear: light hair is of very rare occurrence among half-breeds; they have almost always the peculiar dark and coarse Indian hair; the colors of the eyes show also the same phenomenon. Therefore we may safely say that the half-breed resembles his Indian parent more than his white parent. Two reasons may be assigned for this fact. It may be that the dark hair and the wide face are more primitive characteristics of man than the narrow face and light eyes of the whites. Then we might say that the characteristics of the Indian ar inherited with greater strength because they are older. It must, however, also be considered that half-breeds are almost always descendants of Indian mothers and white fathers, and this may have had an influence, although there is no proof that children resemble their mothers more than their fathers. There is another peculiarity of the measurements of full-bloods and half-breeds which is worth remarking. If we count all the individuals who have a certain breadth of face, say 140, 141, 142 millimetres, etc., it is found

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that the measurement of 148 millimetres, which is approximately the average measurement, is the one which is most frequent. Among Indians it occurs 16 times among each 100 individuals. Among whites the most frequent measurement for the breadth of face is 138 millimetres, which also occurs about 16 times among each 100 individuals. The average measurement of the half-breeds is about 144 millimetres. This, however, occurs only about 10 times among each 100 individuals. If, on the other hand, we compare the frequeney of occurrence of excessively wide faces and excessively narrow faces as compared to the average of each group, we see that they are more frequent among the mixed races than among the pure races. It appears, therefore, that the half-breeds differ among themselves more than do the pure races. But still another phenomenon is of importance. While the average measurement of 144 millimetres occurs only 10 times among each 100 individuals, those of 140 millimetres and 146 millimetres occur each 12 times among each 100 individuals. Thus it appears that the middle form is not as frequent as forms similar to those of the parental races. It may seem that the difference of frequency mentioned here is not very great. It appears, however, that this irregularity occurs in all tabulations of measurements of half-breeds: therefore, it must have some significance. I will call to mind here that the same conclusion has been drawn by Francis Galton from his investigations on heredity; that Dr. von Luschan has also arrived at the same conclusion when considering the forms of skulls of Asia Minor; and that finally the anthropometric investigations on the soldiers enlisted in Baden have given the same results. We may therefore say with a high degree of probability that in the human race the effect of intermixture is not to produce a middle type, but that there is a tendency to reproduce ancestral traits. I shall revert to this matter later on.

The study of the stature of half-breeds reveals biological laws of an entirely different character. The white element which enters into the composition of the half-breeds is very largely of French descent. As the American French are not a very tall race, we may safely say that the white element entering into the composition of the half-breeds is not very tall. Statistics of the stature of Indians show that they may conveniently be classified in three groups: Tall tribes, measuring more than 170 cm.; tribes of middle stature, measuring from 166 to 170 cm., and short tribes, measuring less than 166 cm. When we compare the statures of the tall tribes singly or collectively

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with those of the half-breeds of the same tribes we find that the latter are always taller than the full-blood Indians. This fact and the increased fertility among half-breed women would tend to show that the mixture of races results in an increased vitality. The difference in favor of the half-breed is so striking that no doubt can be entertained as to its actual existence. I believe the cause of this fact must be considered to be wholly in the effects of intermixture, as the social surroundings of the half-breeds and of the Indians are so much alike that they cannot cause the existing differences.

It is not surprising that the average stature of half-breeds belonging to the tribes of middle stature is still more in excess of that of the pure bloods, as in this case the average stature of the white race is probably greater than that of the Indians. The difference is finally still more sharply marked among the shortest tribes of Indians.

Very peculiar conditions are revealed by the comparison of the laws of growth of full-blood and half-breed children. We have seen that the adult full-blood is shorter than the adult half-breed. Curiously enough the reverse is the case among children. Until the tenth year of boys and until the ninth year of girls the full-blood child is taller than the half-breed child, while beginning at this period the full-blood child lags behind. Thus it is shown that the rate of growth among the half-breeds is throughout greater than among the Indians. It would be interesting to carry out this comparison and to include the whites, but the social conditions of the latter are so different that the comparison cannot be made advantageously. The phenomenon that the half-breed children are shorter than the Indian children of the same age is found not only among the tall tribes, but also among those of middle stature. I am unable to say if it also exists among tribes of shortest stature, as I have not a sufficient number of half-breed children from tribes of the shortest stature at my disposal. The comparison of rate of growth of boys and girls of the same ages is also instructive. It is a well-known fact that for about three years, from the twelfth to the fourteenth year, white girls are taller than white boys. This period of superiority of growth of the former is marked very indistinctly among the North American Indians. It is a little more clearly defined among half-breeds, but not as distinct as among whites.

The results regarding the growth of Indians are not quite satisfactory on account of the difficulty of obtaining information regarding the exact ages of Indian children. Only in comparatively few cases is the actual age of an Indian child known. In most cases it is

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estimated more or less accurately by the observer and by the help of persons who are acquainted with the Indian families. As this is true of both Indians and half-breeds the same conditions affect both series and make the results of the investigations comparable. One point, however, must be borne in mind. The individuals composing the young classes are not comparable to the individuals composing the older classes, because in the former there are many who die before reaching the age represented by the latter class. We do not know if the measurements of the body are not in some way connected with the probability of death before a certain age. This objection holds good of the results of all investigations referring to growth which are obtained according to what Hertel calls the general method.

I turn to the discussion of the distribution of stature in North America. On the whole, the North American Indians may be called a tall people. In studying the distribution of statures several difficulties are encountered. The tribes have changed their mode of life and their residence often. It is well known that stature depends to a great extent upon surroundings. Therefore the stature which we observe at present cannot be transferred, as it were, to the region inhabited by the tribe under consideration even a short time ago. One of the most striking examples is furnished by the Cherokees. As well known, the bulk of this people was transferred to Indian Territory a number of years ago, while a certain number remained among the mountains of North Carolina. At present the stature of the latter people is decidedy shorter than that of the Cherokee of the plains. Here we may have a good example of the effect of surroundings, but it may also be that the greater admixture of foreign blood among the people of the plains had the effect of raising their average stature. The same may be said of the Iroquois, Choctaws and Creeks, who are among the tallest tribes of North America. Looking at the continent as a whole, the tallest statures may be said to be found on the plains. The mountainous regions of the Southeast and of the West contain the people of the shortest stature. The whole Mississippi Valley is taken up by a very tall people. When we proceed further northward towards North Manitoba and the Saskatchewan, the statures become shorter. Great differences in size are also found north and south of the St. Lawrence River, the Montagnais on the north side being very much shorter than the Micmacs on the south side. The Athapascan tribes of New Mexico are of middle stature only. Scattered among them we find the extremely short Pueblos. The Shoshone, Sahaptin and Salish tribes, of the Rocky

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Mountains, are of middle stature. As we approach the Pacific coast the distribution of statures becomes more irregular. The most remarkable facts in this region are the increase of exceedingly short statures on the coast of Southern British Columbia, on Puget Sound, in Oregon and in Northern California. With the exception of the Eastern Eskimo these people are decidedly the shortest among all the North Americans. It is very instructive to notice that among these tribes of short statures taller people extend along Columbia River to the Pacific Ocean. As the mode of life of these people is identical, we must consider them the descendants of a taller people.

The distribution of statures in Northern California does not depend alone upon more or less favorable conditions. Thus the considerable difference between the tribes of Hoopa Valley and of Round Valley can hardly be explained by any other means than by assuming that the taller stature of the Hoopa is inherited. From a consideration of the distribution of statures in North America I turn to a discussion of the distribution of head forms. The principal proportion that has been considered in this connection is that between length and breadth of head, generally called the cephalic index. The study of the distribution of the cephalic index in North America is made exceedingly difficult by the prevailing custom of using hard cradle boards. This has the effect of flattening the occiput and thus produces short heads where without the use of the hard cradle board long heads would be found. Besides this the tissues covering the occiput are so extremely thick among the Indians that it is very difficult to discover a moderate degree of flattening. The apparent frequency of short heads among the Winnebagos, Osages and Apaches is entirely due to artificial, although unintentional flattening. The comparison of head forms must therefore be restricted to regions where no deformation is found.

The whole Mississippi Valley is inhabited by people whose cephalic index is approximately 79, that is to say, a mesocephalic people nearly approaching brachycephalism. Around the Great Lakes an increase in this index is found which disappears again further east. The Eastern Arctic coast is characterized by the prevalence of the long heads of the Eskimo. On the North Pacific coast and in isolated spots along the coast we find exceedingly short-headed types, mainly represented by members of the Athapascan stock and extending down the Rio Grande to the Gulf of Mexico. Scattered between these we find another long-headed type, which seems to be most frequent in Southern California, extending northward to the boundary of Oregon and

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probably occupying the Sonora and the pueblos of Queres and Santa Clara. It is not possible to consider these four types as closely related. Each of them is well characterized, and there seems no possibility of combining them with any of the other types. The best known among these types is that of the Eastern Eskimo. Besides the great length of head, they are remarkable for the great height of head and wide face combined with an exceedingly narrow nose. The Indian of the Misissippi Valley is characterized by a large head, mesocephalic, with long occiput, wide and large face and wide nose. His color is light and assumes the so-called copper hue only after exposure to the sun and air. The brachycephalic type of the Pacific coast is at the same time short of stature, of light skin, with an enormously wide face and narrow nose, which is remarkably flat for an Indian nose. The Californian type is best known through a series of skulls from the Southern Californian islands. It is rather low, with narrow nose and moderately wide face.

The distribution of cephalic indices among a few tribes deserves particular mention. The Micmacs of Nova Scotia show the peculiarity that very low indices occur much more frequently among them than among any other Indian tribe of the eastern part of North America. When we compare the distribution of indices among ancient skulls from New England with the series of the Micmacs, it becomes clear that both series are very much alike. As I stated before, indices as low as these are not found anywhere else except on the Arctic coast. I consider this conclusive evidence of an intermixture with Eskimo blood. It is well known that archæological facts tend to indicate that the Eskimo must have lived along the coast of New England at one time. It is therefore of interest to note that this conclusion is borne out by anthropological evidence. If we grant this point, the irregularity of distribution of the cephalic indices among the Micmacs may also be considered as an argument in favor of the theory advanced above, that the intermixture of tribes does not produce a middle type.

Another series of peculiar interest is that of the Ojibway and of the Menominee. In comparing the variability of the cephalic index of the various tribes from the Rocky Mountains eastward to the Great Lakes, we notice that there is a constant increase from west eastward. This means that among the western tribes most individuals are similar to the average individual, while among the eastern tribes the differences among individuals composing the same tribe are greater. When plot-

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ting the cephalic indices of the Eastern Ojibways we find that the same index which is found farther west, namely 79, is the one most frequent, and that the index of 83 is also very frequent, while those indices lying between 79 and 83 are not as frequent. This peculiar fact exists in the series for men, women, boys and girls; therefore, there can be no doubt but that there must be some cause for it. By investigating more closely the distribution of indices among the Western Ojibway, it may be noticed that the index of 83 is still more frequent than it would be if the distribution followed the laws of chance. For this reason I conclude that there must have been among these tribes an intermixture of another tribe having an index of 83. It is difficult to decide who these people may have been, but it is certain that they must have been located around the Great Lakes. An investigation of the prehistoric skulls from this region shows that the index of 83 was very frequent at that time, so that we may be justified in the conclusion that we find here the surviving members of the prehistoric population of the region scattered among the present Indians.

I will call attention here to the peculiar fact, that in several series of measurements of the cephalic index we find two maxima of frequency and a minimum of frequency between the two maxima. As the series at our disposal do not exceed two or three hundred, except in a very few cases, these minima of frequency might be considered accidental. They occur, however, at the same point in the series of women, boys and girls. Therefore, we must conclude that their occurrence is not due to the limited number of observations, but to some actual reason. As mentioned before, this minimum is found markedly in the distribution of the cephalic index of the Eastern Ojibway. It is just as strongly emphasized among the Sioux; but in this case the curve of the men differs considerably from that of women, boys and girls, there being only one maximum in the first curve. We find only a certain irregularity indicating that there are more individuals corresponding to the secondary maximum among women and children than would be expected in a probability curve. I consider these irregularities of the curves of considerable importance, as they show conclusively that anthropometric curves are not always probability curves. This is a matter of great theoretical importance, and must be considered in the statistical investigations of the characteristics of certain races. Wherever we find curves which show two maxima or which are not probability curves, we have no

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right to consider the average as a type representing the people under consideration. In all such cases, a detailed discussion of their distribution is necessary to obtain satisfactory results. In order to give an instance: It is easily seen that if the biological law which I mentioned several times before in the present remarks is correct, — namely, that the offspring of a mixed race has a tendency to revert to the parental types and not to form middle types — then we must expect that in a mixed race, the composing elements of which show great differences, maxima of frequency of two certain forms must be found which resemble the forms of the ancestors and that one minimum is found representing the mixed form. If then we should interpret the observations in such a way as to say that the average is the typical form of this series we should draw a wrong inference. The average in such a case would have no meaning whatever, while the two maxima would indicate the types composing the mixed race.

If the two parental types do not differ very much, we should not find a distribution of forms showing two maxima, but the intermixture would have the result of producing a more variable race. We might, therefore, expect to find increased variability whenever two distinct types come into contact. There are several good examples of this kind. The Kootenay of the Rocky Mountains, who have intermarried with the Salish of British Columbia and Montana and with the Blackfeet of the Plains, are among the most variable of the North American tribes. I believe the cause of this phenomenon must be looked for in the fact that the Blackfeet are longheaded while the Salish are decidedly shortheaded. The Bella Coola of British Columbia occupy a similar position between the rather longheaded tribes of the coast and the shortheaded tribes of the interior. In this case, also, the effect is an increased variability. The same may be said of the tribes on the coast of Oregon.

The distribution of types upon the Pacific coast deserves particular discussion. Beginning at the Arctic coast we find the longheaded Eskimo. The difference between this group of Eskimo and those of Eastern Arctic America is very remarkable. Their heads are decidedly shorter. As they adjoin all along the coast shortheaded people, it seems that the decrease of their cephalic index is due to the intermixture of Indian blood. While on the eastern coast of America we find the characteristics of the Eskimo type to extend to a considerable distance southward, on the Pacific coast this type ends apparently near the peninsula of Alaska. The Aleutians, although speaking a language

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allied to the Eskimo, represent an exceedingly shortheaded type. This is true of the prehistoric skulls as well as of recent ones. Continuing down the coast, we find the Tlingit of Southeastern Alaska, who represent the same shortheaded type, which is evidently identical with the Athapascan type of the interior. At the southern boundary of Alaska the type suddenly changes, and we find a much shorter race, characterized by longer heads, exceedingly wide faces and narrow, high noses. This type embraces all the coast tribes of British Columbia as far south as the central portion of Vancouver Island, with tne sole exception of Bella Coola, which we mentioned before. In the southern portion of Vancouver Island there is another sudden change of type. Here we find one of the shortest races of North America, which is characterized by the most excessive brachycephalism, very low faces and flat noses. I have not been able to find any type which resembles it anywhere else in North America. The peculiarities of this type extend southward beyond the Columbia River, but at the same time the type represented by the Bella Coola and Tlingit re-appears and occupies the greater part of the coast as far south as Northern California. At this place we find another sudden change of type, brachycephalism changes again to dolichocephalism, the stature decreases, and the faces become narrower. I am rather inclined to believe that the type of the coast of British Columbia is closely related to this longheaded California type. This belief is based principally upon the similarity in the formation of the face. Unfortunately I have no material at my disposal from Nevada and California which would serve to carry on this sketch of the distribution of types on the Pacific coast, but what I have said will be sufficient to show how many problems remain to be solved in this region.

It would be an interesting problem to compare the distribution of types among prehistoric American races with those found among the living Indians. For this purpose the measurement of skulls of a number of collections have been tabulated, but the results of these investigations are very unsatisfactory, as in prehistoric times the custom of using the hard cradle board and the custom of artificial deformation was more extensive than at present. An attempt has been made to distinguish among the prehistoric skulls from Tennessee those which have been deformed and those which have almost their natural shape. The result shows that the least deformed skulls have a very much lower cephalic index than the general average, and I presume that if the exclusion of deformed skulls were carried out

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rigidly we should find this prehistoric people approximately to have the same index as the present population of the Mississippi Valley. On account of the great deformations the prehistoric skulls have a variability — that is, differences among themselves, which are in excess of anything that is observed at the present time.

I have not been able to glean any important conclusions from the measurement of the face except the one fact, that the facial index becomes lower on the Pacific coast.

I hope the brief presentation of the results of our studies will show that Physical Anthropology offers a promising field of study, and that another of the important biological questions which await an answer — The History of the American Race — will appear in a new light when all the physical characteristics of the various types are taken into consideration.

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THE ANTHROPOMETRY OF AMERICAN SCHOOL CHILDREN.

BY GERALD M. WEST.

THE World's Columbian Exposition has, among other things, been the occasion of the collecting of a mass of material relative to the laws governing the development of children from the cities of Toronto, Canada, and Oakland, California. This material, with that gathered in Boston by Prof. H. P. Bowditch, in Milwaukee by Dr. Geo. Peckham, in St. Louis by Dr. Porter, and in Worcester, Mass., by the Anthropological Department of Clark University, under the direction of Dr. Franz Boas, has increased the material available for study and comparison to observations on ninety thousand individuals. The wide distribution of the material as to territory, Ontario and the northern and western portions of the United States being very fully represented, and the great diversity of the material as regards nationality and social conditions, add greatly to the interest and value of the results. This material, though quite as valuable, is of a different value from that collected in the various gymnasiums and schools of physical culture throughout the country, since in the latter case, except at the time of first entering, the subjects of observations are, if I may so speak, subject to an artificial rule completely under their own control, looking to a definite result, that is, the greatest possible symmetrical development of the body. In the material here collected there is no such modifying cause, the individuals being left to develop as circumstances largely beyond their control may effect. The final results of such two sets of observations might not be expected to harmonize very closely. The material has been arranged in the various ways best suited to bring out the contrast between the sexes and between the various localities.

First, with regard to stature and weight, the material has been combined to form a general curve showing the average development of the whole population by sexes with respect to these measurements. This has necessitated the laborious task of reducing a large part of the material either to a common age or a common unit of measurement. Next, the averages of the various cities have been compared with the

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general average and the results plotted. I have then compared the average stature of the girls of each year with that of the boys, both with respect to the general population and with respect to the populations of the individual cities.

There have also been taken into consideration the measurements not so generally made as the two preceding ones, *i. e.*, of sitting height, and the measurements of the head and face, consisting of the length and breadth of head and face, and finally the indices, cephalic and sitting height. There is to be considered a very interesting comparison between school children of each sex as to physical development in the light of their mental ability.

The difference in development among adult men and women seems to be the result of two causes, the rate of growth and the period of growth. These two factors seem to vary considerably with respect to locality, social condition, sex and nationality.

The rate of growth varies slightly annually, and apparently there is a well-marked period of maximum annual increase for the curves of the averages, coming, subject to varying conditions, as sex, nationality, etc., somewhere between the tenth and the fifteenth years, and from one to two years earlier in the case of girls than in the case of boys. These "shoots" seem to be the phenomena most characteristic of the various curves of growth. They are absent from none of them, although in some cases they are rather difficult to trace. This latter fact is due to the circumstance that the period of the shoot is not the same for every child, but varies with each individual to such an extent that in a curve of average of a large series the cases are so widely and regularly distributed as to smoothe the curve to nearly the appearance of a straight line. An example of this latter fact is shown most strikingly in the curve of growth of stature of the St. Louis school children measured by Dr. Porter.

A comparison of the curves of growth of the two sexes is most interesting on account of the manner in which it brings out this phenomenon of the shoot. During a certain period, variable in time of beginning and in duration, girls approximate to or exceed the boys in the size of the corresponding parts of the body. The beginning of this period is determined by the time at which the shoot of the girls commences, while the termination of the period is the result of two causes, the actual diminution in the annual increment of the growth of girls and the increase in that of boys, *i. e.*, the beginning of the boys' shoot.

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A consideration of the distribution of cases in the various years is of value, as this varies with age, sex and race. The distribution of cases varies but slightly, though with a certain regularity, until the commencement of the period of the shoot, when it becomes to a marked degree broader, contracting again after the cessation of that period. The measure of this distribution is the Mean Variation, which practically corresponds in its limits with Galton's seventeenth and eighty-third percental grades.

The period of duration of growth varies under the same conditions as does the rate of growth. It is much shorter in general among women than among men, and to this fact almost exclusively is to be assigned the difference in stature, weight, etc., between adults of the two sexes, there being but little difference in the average annual growth of the two sexes between the fifth and the seventeenth years, the latter period being the age at which women apparently reach their full physical development. In the case of men the period is much more extended, Baxter finding growth in stature to continue until the thirty-fifth year in the general population, Gould finding it to vary with the nativity between the twenty-third and the thirty-ninth years, the mean age being according to him the twenty*-fourth year.

When we come to compare the average stature and weight of the school children of the various cities with that of the average population, we find striking differences. The Worcester children are markedly above the average in stature, while the Toronto and Boston children are almost as markedly at the opposite extreme. The Oakland and St. Louis children also show opposite characteristics. The former, starting at five years of age below the general average, rise above it at the end of the period of growth, while the St. Louis children, starting above, fall below the average. The Milwaukee children represent more nearly the general average. There is also to be remarked a striking difference between the curves of comparative stature of the two sexes in the various cities. In Toronto, Milwaukee and Boston the comparative curves for the two sexes are near together. In St. Louis they are quite markedly separated after the fifteenth year, while in Oakland, and especially Worcester, the difference reaches its maximum. The variations in weight are much more strongly marked than are those of stature. Here again we find the

*Thirty?

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Toronto children the least well-developed and the Worcester children the best developed. Milwaukee and St. Louis show opposite tendencies, the former increasing and the latter decreasing weight with respect to the average. Boston occupies with respect to weight about the same position that Milwaukee does to the stature. They approach nearest to the general average. The comparative difference between the sexes is not so great here as in the case of stature, yet the differences are sufficiently marked, Worcester again showing the greatest and Toronto the least, the others being, in order of the least to the greatest difference, Boston, St. Louis, Oakland and Milwaukee.

When we compare the height of the girls in percents of the boys' statures of one city with those of other cities, we find remarkable differences both as to the relative height of the girls and the relative length of time they exceed the boys in stature. The whole range of percental difference between the cities from the sixth to the twelfth year is something less than three per cent., at thirteen over six per cent., returning again at the fourteenth year and continuing at the three per cent. limit until about the eighteenth year, when it sinks to about one-half per cent.

The cities in which the girls are taller than the boys are, in the order of their height from least to greatest, Oakland, St. Louis, Milwaukee, Boston, Toronto and Worcester. The length of time during which the girls are actually taller is, in Oakland, five; Worcester, one, and in the other cities three years each. The Oakland girls exceed the boys in height by the tenth year, the Boston girls exceed the boys by the eleventh year, while in the other four cities the girls do not exceed the boys until the twelfth year. The boys do not completely regain their supremacy in stature in Oakland and St. Louis until the sixteenth year, while in the other four cities this is regained by the fifteenth year.

The plotting of the curves of distribution of weight and stature for the boys and girls from the ages of five to seventeen brings out well the comparative modifying effects of growth on the material. There is found to be but slight variation from the averages at the fifth year, but this variation increases quite rapidly, though regularly, annually, as is shown by the flattening of the curve, until we pass the age of accelerated growth, beginning at about eleven years for girls and thirteen for boys. From then on the curves again begin to increase their altitudes, quite regularly as before, until the adult age is reached.

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A remarkable characteristic of these curves of distribution is the uniformly greater and increasing length of the upper arm of the curve until after the time of accelerated growth, indicating that the asymmetry is caused by the fact that there are some children growing at a rate greatly in advance of the average, while there are none who lag an equal distance behind the average. After the period of acceleration the curve rapidly loses its asymmetry, indicating a return to the conditions of uniformity prevailing in the earlier years.

If we compute the mean differences between the general average and the averages for the six American cities in weight and stature, we find that until about the eleventh year the children develop with comparative uniformity, but from that age the modifying effects of descent and surroundings are beginning to act, causing the mean difference to increase very markedly. A very valuable point is brought out with respect to the effect of school life on the physical development of children by the Toronto measurements. These children were arranged into two classes, "good" and "poor," with respect to their mental ability, and the annual averages formed for the two classes as for the general population. The resulting averages are compared with the city's general average and the differences plotted. The diagram indicates that the "poor" scholars are almost invariably the better developed. The difference is naturally more marked in stature than in weight. The probable explanation for this is that the children adjudged more able by their teachers give more time to study and less time to play than do the children of the other class.

That the effect of the annual rate of growth is of greater importance than that of the length of the period of growth in determining the adult stature of a community in comparisons among the same sex, I think is quite conclusively shown by Dr. Boas' charts, showing the curves of growth of the children of the three groups of Indians into which he has divided his material. They are classified as "tall," "medium" and "short," according to the average stature of the adult males. In these groups we find the period of growth to be practically the same, while the annual increment is less for each group in the order named. While the evidence is not so strong in the case of the material gathered from the American schools, it is nevertheless strongly in the same direction. The Worcester children, who are largely of American descent and of the tallest race, are tallest during their years of growth, while the children of the other cities, who are much more largely of foreign descent, and generally of a shorter race,

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and with the period of growth varying but slightly in length from that of the Worcester children, have a much smaller annual increment.

Further, we seem to find, on comparing children of foreign descent born in this country with children of the same descent born in the native land of their parents, that the children born here are taller and generally better developed.

We have, therefore, two well-defined and antagonistic elements going to modify the development of children: the one conservative (heredity), the other progressive (environment). We find the effect of heredity in the persistence of the same differences in stature, between children of different nationalities under similar circumstances, as appear under the different circumstances of their various native lands.

We find the effect of the favorable environment in the increase of the stature of the children in America over children of the same race in their native land. The unfavorable effects of environment are shown by the difference in stature between children of the same race in the same country, as is so well brought out by Roberts in his investigation carried on in England, where he divided the material according to the prevailing castes. Bowditch has also remarked this in Boston, where he made a somewhat similar comparison.

In the case of sitting height we have two series not exactly comparable, but generally so. These are the Worcester series and the St. Louis series. The St. Louis measurements are arranged around the full year, *i. e.*, all the individuals within six months of a given age are thrown together as being of that age. (The children between five and a half and six and a half are grouped as of six years of age.) The Worcester children are grouped within the respective years, *i. e.*, children between six and seven years of age are grouped as if six years of age. We see, therefore, that the Worcester children are for each year half a year older than the St. Louis children of the same apparent age. Considering the Worcester curve first, we find the girls and boys to be about the same length of body at five years of age, but the boys grow a little more rapidly, apparently, than the girls between six and eight years, giving them the superiority which they retain until about the eleventh year. At the eleventh year the girls make a rapid advance, pass beyond the boys and continue in advance of them until the fifteenth year, when the boys have regained their superiority. Sixteen seems to be the point of maximum development in the length of

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body among Worcester girls. The boys' development continues for some time thereafter.

On examining the St. Louis curves we find that the boys are markedly taller than the girls until nearly the twelfth year, when girls shoot past them and are taller until the seventeenth year, by which time the girls have almost ceased growing. On comparing the facts developed by these two sets of curves we find that, while in the very early years, in both cities, the boys are generally of greater length of body than the girls, later the girls become superior. The Worcester girls begin their shoot about a year earlier than do the St. Louis girls and lose their superiority about a year and a half sooner. The Worcester girls seem also to reach their full development in this direction a year or two the earlier, the Worcester girls at about sixteen years and the St. Louis girls at about eighteen years.

On examining the curves of the index of height sitting,—the length of the body expressed in percents of the stature,—we find them both exhibiting a decided minimum. The boys' curve is above the girls from about seven to eleven years, but thereafter the girls curve is considerably the higher. It would seem from this that up to the eleventh year the boys' length of body grows more rapidly in comparison to the stature than does the girls', but after that age the girls' body grows proportionately the more rapidly. We find that the lowest point reached by the girls' curve is at about twelve years of age, while the lowest point reached by the boys is about fifteen. This indicates that, in girls until the age of twelve years and in boys until fifteen, the lower limbs grow more rapidly than the body, but that after that period the body grows more rapidly. The lower limbs throughout grow more rapidly in boys than in girls, and the body in girls than in boys.

The measurements of the head will next engage our attention. First is the length of head—the greatest anterior-posterior diameter through the glabella.

The curves for the Worcester and Toronto children show a continuous but somewhat irregular rise throughout the growth period. The boys' measurements are, contrary to what we have found in the other measurements considered, greater at all times than those of the girls. There is, however, a suggestion of the phenomenon of crossing in the near approach of the two curves at about the ages of thirteen or fourteen. The girls seem to complete their development at about the

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seventeenth year, while the boys continue to grow for some time after.

The width of head—the greatest transverse diameter—shows phenomena in no respect different from those of the length of head. The boys have the greater diameter, and the diameter continues to grow for a considerable period after that of the girls has ceased. The nearest approach is between the thirteenth and sixteenth years.

The cephalic index is the expression of the width of head in terms of the length. Its curve shows considerable irregularities, but with a general tendency to fall from the fifth year until the final cessation of growth. The fall of the curve indicates that the length develops more rapidly than the width of head.

The whole range of both curves is contained within three per cent., the boys having a slightly greater range than the girls.

These curves bring out the fact that, as a rule, the girls have broader heads in comparison to the length than do the boys. They are both mesocephalic at all ages. This seems to show that the cephalic index is practically constant throughout life, and, therefore, in computing this index age will not be a factor to be considered.

The face measurement: the width of face,—greatest distance from the external surface of one zygomatic bone to that of the other,—brings to view more strongly than in the two preceding measurements the phenomenon of crossing—this occurs between the ages of twelve and fourteen years, except during that time the boys' faces are the broader. If we compare the width of face of the girls and boys to the length of head, we find that until about the sixteenth year the girls' faces are comparatively broader. The continual rise of the curve shows that the width of the face develops more rapidly than the length of head.

Comparing the width of face to the width of head shows that here also the width of face of the girls is comparatively broader at all times, except perhaps at the sixteenth year. This curve is much steeper than the curve of breadth of face to length of head, indicating that width of face grows not only more rapidly than the width of head, but more rapidly in proportion to the width of head than the length of head. It seems, therefore, that the development of the face is greater in the girls than in the boys, in comparison to the development of the brain case.

It is, unfortunately, impossible to compare directly the results obtained in these head and face measurements already discussed with

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those obtained in St. Louis, owing to the fact of the St. Louis material having been computed and arranged on a somewhat different plan, but these results do not in the least contradict the showing of the Worcester and Toronto material. There is, however, one thing to which attention should be called, that is, to the difference between the cephalic index of the two groups of children. Among the Worcester-Toronto children we have found the cephalic index practically to be between 78 and 80, with an almost continuous downward tendency of the curve from the fifth year to maturity. Among the St. Louis children the curves range between 78 and 82. There is a decided upward sweep from the sixth to about the eleventh year, and then a much more emphatic fall than in the Worcester curve. The boys seem to have the broader heads between 15 and 17, while at other times their heads are decidedly the narrower.

Comparing the measurements of the head and face to the stature, we find first that in comparison to their stature the length of head of boys is greater than that of girls until the fifteenth year, when their respective comparative lengths change places, and we find the girls' heads becoming suddenly the larger and continuing so throughout life. These statements apply also to the comparison of the width of head to stature, with this one exception, that is, that here again we find, strangely enough, the phenomenon of crossing which is so characteristic of the curve of the absolute measurements. The boys' curve passes below the girls' from the tenth to about the twelfth year. The boys' curve passes permanently below the girls' about half a year earlier than in the case of the length of head to stature. The curves of width of face to stature show more resemblances to the curves of width of head to stature than to the curves of length of head to stature. The differences are that the preliminary intercrossing of the curves is at about eleven years of age, and the final intercrossing is at fifteen, somewhat later than in either of the preceding cases.

In the St. Louis curves of these same comparisons we find the same characteristics brought out, though in not so marked a manner. In the curves of the comparisons of width of head and width of face to stature the curves nearly touch at eleven years of age, but do not cross. The time of final crossing is, as in Worcester, fifteen for the width of face to stature and sixteen for the other two curves, a year and a half later than is the case in Worcester.

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THE DISCOVERY OF AN ARTIFICIALLY FLAKED FLINT SPECIMEN IN THE QUATERNARY GRAVELS OF SAN ISIDRO, SPAIN.

BY H. C. MERCER.

THE hills of stratified gravel at the hamlet of San Isidro, on the right bank of the Mazanares, opposite Madrid, have for some time ranked with St. Acheul and Abbeville, Thetford and Hoxne, as among the sites noted in Europe for the demonstration by discovered human remains of a quaternary maker of "paleoliths"—of a man who, as there, the contemporary of fossil elephants, chipped, but could not polish, stone.

Where the gravel quarry of Eusebio Cubero and the Carrena Sacerdotal have sliced down several hills near the San Isidro cemeteries, the prominent yellow exposures, reaching up 40 metres above the present Mazanares water level, catch our eye as we leave the Toledo gate. Here Signor de Prado speaks of artificially chipped flints having been found about 1850, since which time numerous observers and students have visited the place. De Prado in his drawing divides the deposit, judged by the appearance and kind of the stratified bands, into three layers, and after discussing, as others have done, its manner of deposition, whether due to glacial or non-glacial agencies, says that it rests on a bed of tertiary marl.

Either he or M. de Verneuil, who afterwards visited the spot, first realized that the chipped objects, which, however, neither say they found in place with their own hands, resembled the Abbeville specimens.

Signor Villanova, continually visiting San Isidro with his pupils, speaks of more "implements" and fossils, but notes no personal discovery. He denies that De Prado's triple subdivision is correct and produces a cut of his own. De Mortillet publishes another, generally resembling De Prado's, but noting an evolution from the bottom up-

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wards in the forms of implements discovered. This M. Cartailhac reproduces in his recent work on Spain, in which he speaks of obtaining an implement, though not with his own hand.

Without going into details here as to these accounts, the chief ones, I believe, thus far published (with one possible exception to be noted), two facts are plain as to the testimony of previous observers.

1. They agree that the gravels lying upon tertiary marl are quaternary in age. As to the manner of their deposition, whether enormous freshets in the Mazanares laid them down, whether cross-country deluges from melting glaciers whirled them into place, whether the more immediate down-melting of ice-crusts rolled them where they are, there seems to be difference of opinion, but these discussions need not concern us if we learn from another source that the age of the deposit is fixed, that they contain quaternary fossils; and here the authorities referred to are all agreed.

No matter how the gravels were laid down, they are of the same age as the quaternary bones they contain.

2. The next point gleaned from these previous observers is that they have attempted to subdivide the gravels into epochal layers, and have disagreed about it, and therefore have differed with regard to the relative age and relative position of the fossils and flints said to have been discovered. Have we three separate and distinct layers, or two, or only one? As we stand before the splendid exposure at the Eusebio Cubero quarry, marveling and confused at the painted bands of sand, pebbles, clay and marl, how shall we subdivide the oft-recurring stripes, now red or green, now yellow or white, now contorted, now level, that confront us?

If by the test of paleontology, which has been almost denied to us at Trenton, then there ought to be continual recurrence of particular fossils in particular layers. If by the less sure test of geology alone, then there ought to be certain and invariable qualities in particular layers, to distinguish them one from another; but, unfortunately for San Isidro, thus far authorities agree neither as to the position of the fossils nor as to the position and kind of the layers. So both tests fail, and we are left still to ask whether any subdivisions in time at all can be made out in the laying-down of the deposit, and whether, so far as such differences concern anthropology, it ought not to be considered a homogeneous mass throughout. This brings us to one further point noted in the series of previous observations, which is that—

3. There is no distinct statement in the above accounts (save

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the one to be referred to) of either fossil or "implement" having been found by the describer *in place with his own hands*, and we cannot help inferring that most, if not all, the chipped specimens have been obtained, as I obtained mine at Abbeville, and as I am informed that nine out of ten in France have been obtained, from workmen.

With these considerations forced upon us by a study of the place, we are discouraged. Everything is vague, contradictory and indefinite. For want of solid foundation the edifice of early human development at this interesting spot seems to be crumbling away, and we are willing to give up layers successive in time, to give up epochs of evolution in stone flaking, if we can only find a chipped flint or a fossil that we can be sure of somewhere in the gravels.

It was in this state of mind that I saw the specimen here shown, on December 30th, 1892, protruding for about one inch of its base from the perpendicular face of the Carena Sacerdotal, nearest the cemetery. As I could not reach it from the path that skirted the bluff on top of the talus, I made a foothold in the hard sand, and, standing in it, as I held on to a frozen seam, pried and gouged at it with a piece of lath.

Only its rough base showed, and I could not recognize it as artificial until, after nearly fifteen minutes of scratching, grasping and pulling, the frozen sand gave it up and I held it in my hand.

Mr. Stewart Culin, my companion of the morning's expedition, and our assistant with the camera were then at the Eusebio Cubero quarry, a quarter of a mile away, and I ought to have called them both before I pulled out the specimen, but I did not, nor did I leave it in its matrix, as a workman was looking at me, but carried it around the hill, found Mr. Culin, showed it to him, returned with him and replaced it, so that, standing below on the talus at about a hundred feet away, he could clearly see its general relation to the stratified lines. Then I climbed the hill from behind and measured its depth—1 metre 80—below the surface.

Removing it again, we went to luncheon, to return in an hour with our assistant Iglesias and photograph it several times, and on the following day, as the matrix was still intact, I again returned and made the plaster cast of the cavity, now in the University of Pennsylvania's museum.

In my subsequent study of the spot, Signor Villanova being ill, I was accompanied by Signor Quiroga, curator of the zoological department of the Natural History Museum in Madrid, who very

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kindly helped me measure the various cuts, and remove from the face of one of them what I had suspected was a fragment of brick, but which turned out to be a piece of porphyry.

Neither he nor I, though I had examined the gravel cuts of Trenton, Abbeville, St. Acheul and Chelles, could lay claim to trained geological discrimination, so that, aware of the sincere doubts that have arisen and the need of extreme accuracy, I asked myself the following questions:

1. Was the gravel stratified? Yes. Several clearly defined lines or stripes of coarse pebbles ran along the cut's face at varying depths, some nearer the surface than the specimen. Because these could be traced continuously, and sometimes around the corners of the perpendicular exposure; because the specimen was only 1.80 metres down, and because the hill-top, save for a few ancient rubbish heaps, was level and unbroken to the extreme brink, it followed that the object was neither in mixed talus nor in one of those down-faulted areas such as I saw over a "puit" at Abbeville, where the whole bank had moved downward, but preserved its stratification.

2. Had the specimen been artificially intruded from above? Potsherds and charcoal, we soon found, strewed the surface of the hill-top, penetrating to the depth of at least a foot through the surface loam. A geologically modern people had therefore dwelt there. Had they, by digging holes or otherwise, intruded their remains into the gravel?

Yes, they had, and we were at first startled to find, at a distance of 45 metres to the north of the flint, some bits of bone and potsherds bedded in the gravel fully as deep as, if not deeper than, our specimen. For a long time we worked at the spot, but when the now thawed sand on both sides was pared clean with shovels, the V-shaped outline of a pit extending from the surface down, full of blackened earth, loam, charcoal and the objects above noted, about four feet in diameter and seven feet deep, was plain. No lingering doubt remained in our minds as we walked away 100 yards and saw the black notch painted clear against the reddish brown, and as, returning again, we saw clearly the undisturbed sand and one of the pebble lines end on one side of the intrusion and begin again on the other.

When Manuel Cubero, son of the lower-quarry owner, took us to his house and showed us the fragments of a pot, which he said he had found at a similar depth in another cut since dug away, we were not surprised. No better chance, we thought, could have offered to

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SPECIMEN FOUND DEC. 31, 1892, AT THE CARREÑA SACERDOTAL, SAN ISIDRO, MADRID.

THE GRAVEL EXPOSURE AT THE CARREÑA SACERDOTAL.
(The boy points to the specimen protruding from the gravel as found Dec. 31, 1892.)

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enable us to study artificial intrusion, and decide whether or not the flint object had found its way down by a similar means.

When, however, we returned to the site of the specimen, we found that it was on a level with the longest of the pebble stripes, but that the latter faded away to the right of it about five feet before reaching it; that another similar pebble line began again somewhat higher and about six feet to the left, running around the bluff, and that a third more confused series of coarse lines began still higher and farther to the right. Not one of these stripes, therefore, ran directly over the specimen; while, on the other hand, none ended abruptly. Between the specimen and the surface there was about 1.30 metres of homogeneous red sand. Where I had pared this clean at the intrusive notch, I had found no fine waved lines in it. I ought to have pared it again over the specimen, but I did not, contenting myself with a close inspection from the top of a ladder.

If a hole had been dug from above, at the pottery epoch, the conditions of the other intrusion, I believed, would have been to some extent repeated; some of the black loam, if nothing else, would have shown in the sand; but it did not.

As to the other doubts:

3. Did the specimen slide down and become reset in a pasty scum on the face of the cut? No. While I admit that an arrowhead or small chip might keep glued to furrows in the perpendicular wall, as it trickled down, to halt occasionally at the command of frost or heat, this object was too heavy. It must have tumbled.

4. Had the specimen slipped into the cavity of an uprooted tree? Hardly. A tree large enough to let it down 1.80 metres, by up-rooting, would have had to grow, I believe, after the forming of some of the surface loam. If it had, then some of the loam would have fallen into the hole with the specimen. But, as noted before, there was no loam or trace of the surface layer to be seen.

5. Had it come down by an earthquake fissure, a tap-root hole, or an animal burrow? It seemed to me that the former, though I have never seen one, would have faulted the pebble lines noted, and all these apertures, if of the pottery period, would have let down loam. But there was, as remarked before, no loam-darkened hole outline on the face of the cut, and no loam particles stick to the sand-capped cast of the matrix, now in my possession, to indicate any burrow or fissure running in diagonally from behind. So the possibility of these and all other apertures, natural or artificial, comes down here

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to one test at last—the test of loam. As there was no loam, we reasonably think there was no aperture during the age of loam. But what if there were apertures when the gravel was homogeneous to the top; when nature had as yet laid no covering over the bleak strand? If there were apertures then, who shall now detect their trace, though even as to these "ifs" we would not be left in the dark, had we found its lines of stratification run directly over the specimen.

We will therefore keep the "ifs," for so convinced am I of the value of clean-cut lines of stratification that I do not complain if this specimen is ruled out, or kept waiting for corroboration, because I did not find them clean, clear and unmistakable, streaking the bank above the resting-place.

So much for this discovery. Now one word as to recent corroboration.

M. L. Siret, of the Ecole d'Anthropologie, Paris, says briefly in *L'Anthropologie* for August, 1892, p. 403:

"San Isidro is known; I have finished studying the bed, making cuts, and 'retirant de mes mains,' a certain number of flints and quartzites in place. I cannot affirm that but one layer contains chipped objects, but it is very rich: I speak of the three upper metres, where Chellean, Mousterian and even Solutrean forms are together."

When I first heard of this, after my return to America, I hoped to have been able to compare notes with M. Siret, but the president of the Ecole d'Anthropologie informs me in a recent letter that he has heard of no further or more definite publication by him upon the subject.

Finally, as to the object itself, granting it to have been found in place: Is it a finished implement, showing the best work its maker could or would do, or is it an unfinished implement, whose maker might have chipped out under favorable circumstances a better thing?

To answer questions of this sort, we set to work in America to study the stone-chipping processes of the modern Indian, whose workshops and quarries had so long lain unnoticed under our eyes. And it soon became apparent that we could no longer gather specimens of this sort upon the surface here and call them "paleoliths," for we found beyond a doubt that the geologically modern Indian habitually and incessantly made them.

When next we found that he littered the refuse of his blade-material quarries, we knew why he made them. They were "wasters," abandoned because unfit for thinning down into certain kinds of finer blades common at the village sites.

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Still keeping to our village sites and quarries, and marveling at the number of these once mysterious objects that turned up everywhere, we felt disposed to call them all—if of American Indian pedigree—"rejects," until a careful study of certain new sites, and the valuable discovery, by Mr. Ernest Volk, of two well-arranged caches of them, buried in the ground in layers, and therefore not discarded, made us realize that certain of the rough-looking ones were not "rejects" after all.

But if we gave up the right always to say "reject" to these Indian stones, we held on to the right to say "unfinished implement," and, still judging from them and the class of work they represented, were led for a time to suspect that a chipped implement, to be finished, needs to be specialized.

When, however, we realized that Professor Joseph Leidy had seen Ute Indians knocking disc-like flakes from pebbles at a single blow, to be used as "teshoas," or hide-scrapers, and found similar discs with the pebbles from which they had been knocked at many village sites on the Delaware and Susquehanna, and again saw others somewhat modified as if for hafting, from the shores of Lake Michigan, and when we compared these American teshoas with Easter Island knives, Admiralty Island and Australian gum-hafted blades, that were only chips not specialized at all, yet finished implements, we had to give up the test.

Still it was a good deal to have the pedigree of so many of these rude Indian-made objects, and we are still casting about to see what they may have to tell us of the general principles which underlie the art of chipping stone in general throughout the past of all mankind.

Meanwhile new facts come to light. We now learn that there are "turtlebacks" and "turtlebacks"—turtlebacks of the quarry and turtlebacks made at the riverside of material there at hand. And more digging tells us that to find a "turtleback" does not necessarily infer the status of culture of a people who had discovered and worked quarries, for it seems that we have reason to suspect from certain evidence that the Indian chipped "turtlebacks" on the Delaware before he made the broad, thin blades. Yet it was for the sake of these we supposed that the quarry work had been done.

If, then, as to the geologically modern North American Indian, we may not yet vouchsafe to fully solve the problem of these rude stones, how shall we offer to characterize as finished or unfinished

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this other, which, if no mistake has been made, belongs to a remote time upon another continent?

We are but on the threshold of a large subject. Excavation is what we need, and identification of specimens with fixed geological horizons. Evidently we must make haste slowly.

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ABORIGINAL AMERICAN MECHANICS:

A Study in the History of Technography.

BY OTIS T. MASON.

A MECHANIC is one who is skilled in the use of tools, who works habitually in some kind of material to shape it, who makes thereof something useful. He is, therefore, an artisan or artificer. He practices always some kind of elaborative industry, by which materials are changed in form to adapt them to the use of others. Finally, he is a utilitarian. His works are designed to supply some need. As distinguished from an artist, who works in order to give pleasure, this man toils to feed the hungry, to clothe the naked, to house the shelterless, to enable all mankind to do their work, whatever it may be. The modern mechanic is absolute master of the earth. There is little that he cannot lift, remove, dissolve, penetrate, transform. A catalogue of his tools and appliances would define all the trades and industries of the world. All the material resources of the earth, mineral, vegetal, animal, are his. The winds, the waters, the fire, the sunlight, the lightning are his servants. He understands the nature and transformations of forces, the constitution and molecular activities of matter, the nature of living beings. He has devised means of multiplying himself, of converting space and time and weight, one into the other. And now he dreams of new applications of force and combines with his fellows to construct and govern society. The most favored nations have not always been so blest but the mechanic, like every other product of nature or of culture is the result of many evolutions.

The first of them had a poorly furnished workshop. "His body," as Emerson says, "was a whole chest of tools." But he had not the knack of using them. He was naked and houseless. His needs, out of which all arts in all ages spring, were few. His mission was to subdue the earth and to redeem it. Compared with his progeny of our day, he would seem an object of pity. But his brain was superabundant. His soul was full of capacities. He was the father of us all.

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In studying the history of technography, the first question that arises relates to the terrestrial resources and conditions wherein the arts of man are to be developed. The globe is not homogeneous for this purpose. There are regions in which the only stimulus to labor is hunger, and in some of them the banana, the bread-fruit or the date tree holds out its bountiful hand and begs men to partake without an effort. Other regions of this class are more poorly provided with food products, and the search is there more stimulating.

In a second class of regions the stimuli are hunger and danger. Besides the quest for food there are lurking beasts to avoid, to kill; or, in later times, there are enemies on the war-path. This class of regions would stimulate to food-quest and defense.

A third class of regions present a variable climate; cold and heat, wet and dry seasons create new pains, drive to new activities, and the quest becomes one for food, defense, clothing and shelter.

A fourth class of regions add to the resources and characteristics just mentioned this one, that the people can live in one part of it in one season, say on the banks of rivers, but they must move to another part of it in another season. Here the activity of migration is added to the others, and if this be partly by land and partly by water, the foundations are laid for the modern arts of transportation and conveyance.

A fifth class of regions happily is furnished by Nature with some plant or animal which yields readily to cultivation. It is easier and more profitable to plant the crop or to rear and tend the herd of these than it is to reap the wild seed or chase the wild game. Herein is a stimulus to agriculture and the domestication of animals. How favored such regions were in the old, old days none will ever know, for the record is lost in prehistoric times.

The present study has reference to the mechanics of the two Americas before the discovery by Columbus. We shall inquire into the materials upon which they worked, the tools and mechanical appliances which they invented and used, the products of their industries so far as they have been gathered from the graves of the past and taken from the hands of the present Indians. In conclusion, a few words may be said concerning the grade of culture indicated by these works and the relationship which may be found between trades, on the one hand, and language, nationality and environment, on the other. The tool of the artisan is fitted to the hand; but to the scrutinizing glance of the student it is just as nicely fitted to its environ-

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ment, to the work which it has to perform, to the grade of industrial education which the owner has reached, to the genius of his people, and even to their language and mythology. The director of a large museum, on examining an implement new to him, is quite as likely to fix his attention upon the region, or the work to be done, or the standing of the owner, as upon his blood or nationality. The continent of America was largely the director of the arts of the aborigines.

To study the mechanics of America, one may classify them, by the material in which they operated, as workers in stone, clay, wood, fiber and so forth. Or we may class them by the things they made, as bowyers, fletchers, boat-builders, potters, basket-makers, skin-dressers, bread-makers, and the like.

A third plan is to disregard the workman to a certain extent and give attention to the apparatus and the methods employed in given operations, whatever may be the material or the product. For the present study this method may be chiefly employed.

The aboriginal American mechanics had to do with *tools*, with *mechanical powers*, with *metric apparatus*, with *engineering*, with *natural forces*, and, to a limited extent, with *machinery*. The examination of these will be instructive in the history of the evolution of industry, for, while the savages of this continent have contributed very little to the mechanics of the world, their tools and methods and results bear a close resemblance to those of our own ancestors and to other now cultured peoples when they were in this part of their industrial curriculum. The tools of the people we are now considering belonged to the following classes:

1. Tools for cutting, with some sort of edge, or, as we say, edged tools.

2. Tools for abrading and smoothing the surfaces of substances, like our planes, rasps and sandpaper.

3. Tools for striking, that is, pounding for the sake of pounding, or for crushing and fracturing violently.

4. Perforating tools.

5. Devices for grasping and holding firmly.

The action of the hand or hands in using these various classes of tools decides their form and mode of action. For instance, the cutting or edged tool, working by steady pressure, becomes a knife or a plane; working by a blow, becomes a chisel, or ax, or adze; and, held and operated on edge for the purpose of bisecting something, is a saw; though, in the latter case, the operation is rather through an abrasion.

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The abrading and smoothing tools, according to the method of holding and working, when they cut away material by the edge or point, are scrapers and gravers; when they abrade over their entire surface they act as rasps or sandpapers; when they are employed to put an edge or point upon tools, they replace our whetstones or grindstones, if they act by friction. Finally, these rubbing tools may act to smooth and crease the surface of the material, without taking away any of the substance at all.

The class of striking, fracturing, crushing implements, when acting by a sudden movement and producing a shock, are hammers or mauls, but, used in a mortar on paint, or tobacco, or foodstuffs, they become pestles. But the latter class, when they are moved horizontally, and have broader surfaces, are termed mills, metates, mullers. Finally, in this fracturing class, working by pressure, is a wonderful art, now almost extinct except among the glaziers and flint-knappers, and that is the breaking of flinty stones by pressure. The aboriginal flint-workers throughout the world carried this craft to its highest perfection.

The class of tools for making holes by a blow, such as punches struck with a hammer, are not common among savages, but sharp sticks weighted with stones, and poles shod with spuds of ivory, are common. Awls, needles and prickers, pushed by the hand; gimlets, or something answering thereto, worked by a reciprocating motion; and drills, kept in motion by strings, were all developed in savagery.

For such devices as pincers and vises the primitive tribes have their substitutes. The handy tools of our day do not change the mode of action, they do not add many new ideas out and out. They substitute better material, work more rapidly and introduce co-operation in their action. They are more often now driven by power rather than by hand. But the American mechanic before the days of Columbus had a respectable tool-chest, as his works will testify.

The knives, shears, planes, axes, adzes, chisels, gouges and saws of the aborigines of the Western continent were of stone for the most part. The use of teeth, shell and copper for such purposes was limited. Bronze may have sparingly entered into the list of cutting tools among the advanced nations. For cutting, the Americans used both chipped and polished implements, and had a great variety of forms for working in hides or wood, or in ivory, antler, horn, slate and such hard materials. These tools were best developed in the

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places where the best material abounded, such as British Columbia or the West Indies.

The second class of tools in America were also largely of stone. Scrapers, gravers, rasps, whetstones and grindstones are to be seen in abundance in all collections. The modern tribes, however, in addition to all these, use the leaves of grasses containing silex, skins of fishes, edges of shells, the incisor teeth of the beaver and other rodents, and many of these do excellent execution.

For polishing the surfaces of pottery and other work the finest stones were used. Oils and paints and varnishes, and even lacquers, were employed to give to wood-work a finished appearance.

The American hammer for driving wedges and tent-pins, for crushing bones, softening rawhide, breaking stone and ore, varied in size according to use, but did not differ from those in use on the same spot in our day except that the handle never passed through the poll. It always grasped it.

The hammer-stone, a flat disc of hard material, for hammering stone, was also universal. After Mr. McGuire's successful experiments with this tool and his writings on the subject it is only necessary for me to refer you to his publications.

Mortars for paint, tobacco and food, and metates for food and clay and chocolate, are to be found in all latitudes. From a hole in a natural bowlder, in which an elongated pebble was worked, to the intricate California acorn-grinding apparatus, with its exquisite basketry hopper, or to a Mexican metate, tastefully carved, there are several grades of technical education, filled by the triturating and rubbing apparatus of other tribes. There were no mills in America four hundred years ago, turned either by man or beast. The grinding was done with metates and in mortars.

For making holes, the implement of chief importance is universal, namely, a sharpened bone, used as a marling-spike is employed by sailors. The skin-sewer and the basket-maker could not do without it, and hundreds of examples are found in their graves. Men, for making holes, used the ice-pick of ivory, gimlets of bone and flint, but the drill was also universal. It was found in three forms: the pump-drill, the strap-drill, the bow-drill. The shaft was weighted as in a spindle, the point was of stone, or wood, or copper, for various uses, and sand was employed by the stone-cutter to enforce his drill.

For grasping hot stones, the American mechanics used tongs of wood, and in lieu of vises and strong pincers they resorted to the

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shrinking of vegetable fiber and of rawhide. They made a kind of clamp of two stout bits of wood, wrapped the two ends with spruce-root or rawhide, wet, and allowed it to dry. In this way the parts of a box could be held until they were sewed.

For nails and screws, the Western mechanics employed "tree-nails" and all sorts of rope and twine and sinew cord and rawhide string. They also made excellent glues and cements, from both vegetal and animal substances. For tightening a joint, they knew how to take advantage in the twisting of a rope. The power that can be put into a half-inch sinew-rope, by means of a trusty lever, is very great. The Eskimo bow is thus tightened. These mechanics were well versed in the use of fire as a tool, excavating and bending wood thereby, and, among some tribes, the bow was rendered more elastic in this manner.

The ingenuity of the American mechanic in hafting his tools and bringing them to their work cannot be overlooked. In this study the archæologist must learn of the ethnologist. The study of hafting must take into consideration the grip and the attachment. The grip of the implement may be a part of the object itself, or it may be a separate piece fastened on. In the Eskimo scrapers, women's knives, men's knives, throwing-sticks and harpoons, the greatest care was taken to have the grip so fit the hand and fingers that the greatest force and dexterity could be used in operating them. For attaching the handle to its object the following devices were employed:

1. A straight handle to which the working piece was seized. Example—Some kinds of arrows.

2. Same as No. 1, only the working piece was laid alongside a shoulder, or in a groove or mortise. Example—Harpoons, spears, arrows, chisels.

3. The grip has a longitudinal groove cut out and the working part driven in. Example—Women's knives.

4. The handle cut from a tree, so as to preserve a part of the trunk for attaching the working part. Example—Ice-picks, adzes.

5. Grooved working parts, so that the handle could be bent around or in some way lashed thereto by a rawhide. Example—Axes, mauls.

6. Perforated handles. Example—Celts (Carib).

7. Perforated working parts. Example—Arrow-straighteners.

The MECHANICAL powers, in the order of their simplicity, are the *inclined plane*, the *wedge*, *lever*, the *roller*, the *pulley*, the *wheel and*

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axle, and the *screw*. These devices for converting time and weight and velocity into momentum, and for changing the direction and character of momentum, are at the foundation of the modern intricate machinery. But the simplest forms of all these useful things were elaborated by primitive mechanics with what little suggestion they could get from the animal world.

The inclined plane, both for rolling and sliding friction, as wel as for convenience in walking, is too easy to dwell upon. The Eskimo sledge men, the hunter dragging his game, the fishermen on a sloping beach landing a great sea monster or a canoe, the Indians of the canons making a trail, the Caribs launching a pirogue, the mound-builders or the Mexicans ascending a great ceremonial earthwork, were equally skilled in selecting a gentle slope or in making one. The natives of British Columbia make skids of stout saplings, and on them roll up the logs that are to form the plate pieces of their communal dwellings, holding them in position by means of shore poles. The great stone buildings of Mexico, Central America and Peru were the work of men's hands, with no aid from animals or natural powers. The invariable association of all such structures with sloping earthworks and pyramids points to the chief mechanical power known to the builders. An additional value is given to the inclined plane in that it allows the co-operation of as many individuals as are necessary, and it also lends itself to co-operation with the other powers.

The wedge was in universal use among the American native mechanics:

1. To tighten the working part of an implement in its hafting and seizing.

2. To split long puncheons of cedar logs, to be used in the roofs and floors of houses.

3. In riving from standing trees annual layers betwe en two scarfs (kerfs) as an aid in felling the tree.

4. In spreading the sides of a canoe for inserting the thwarts.

5. For lifting heavy weights on cob work. There is authority for this in the history of the Superior copper mines.

Finally, for any splitting or compressing that might need to be done.

The wedges were always made of the hardest material known in any region. Wood, ivory, elkhorn, bone, and even hammered copper did service.

Wedges were driven home with hand hammers and mauls. The

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former were of one piece, in shape of a pestle or a slab, but more nicely finished, and were for one or two hands; the latter were wrought out of the hardest material, hafted with great ingenuity, and cut frequently to imitate the heads of animals.

The principle of the wedge entered into that of professional tools, such as needles, prickers, and knives for splitting.

The lever is somewhat harder to trace in savage America. The Eskimo, in tightening and relaxing their sinew-backed bow, use a lever of ivory, which makes half a turn, and is then slidden its whole length between the strands of the cable to repeat the process. For lifting or prying heavy weights, aboriginal man, for some reason, prefers a dead lift. Any one accustomed to handling common men has many a time been astounded at the pains they will give themselves before they are willing to think and plan. However, for twisting the cable in a fox trap, for taking the slack in a swinging bridge, and for moving heavy stones and weights, the lever is always at hand. Mr. Holmes has not hesitated to put a crowbar in the hands of one of his quarrymen.

The roller I have found certainly in two areas. The Eskimos, in landing a heavily laden skin-boat, according to Elliott, lay down on the beach, in a row, inflated sealskins, used as floats with their harpoons. Upon these the craft is beached without the vexation of unloading her. A moment's reflection will show that in this apparatus the pneumatic tire is foreshadowed.

The other example of the roller is the use made of it on the North Pacific coast in moving the great logs to be used in constructing the communal houses.

The pulley in its simplest form is described as an invention of tepee-dwelling Indians of the plains. When the women had set up the three chief poles of the tent, the skin cover was hauled up by a line fastened to the top margin, passed over the fork of the poles above and hauled by women at the other end. When the time came to strike tent, the line was loosed and the poles drawn together at their bases. Elliott, however, figures a group of Eskimos landing a huge walrus by means of a compound pulley. A long, stout walrus line passes around greasy pegs driven between the rocks and through slits cut in the animal's hide.

There was nothing on the continent that could be compared to a wheel, either for carriage or for mechanical purposes, when Columbus discovered America. The fly-wheel was well known and widely dis-

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tributed on spindles and drills, but there were no wheelbarrows, carts or carriages, no cranks, or windlasses, or capstans. But the Alaskan Indians, and perhaps others, used the parbuckle, which combines the roller and the pulley in the same device. For hoisting logs, a rope was fastened to the tops of posts, passed down under a log in the ground, back over the top of the post and down to the ground, where it was seized by men.

Dr. Boas figures in his Central Eskimo a plug of wood with a thread cut on it, to be used in stopping the blood flowing from a wounded seal. This is the only aboriginal screw ever heard of in America. This is quite strange, since every wrapping and seizing is laid on spirally, in the most orderly manner, on the tools and weapons of the aborigines. Tylor informs us that, though the principle of the screw was known to Greek philosophers, the mechanics of the classic times used nails, but no screws, and did not understand the gimlet or the auger.

The METROLOGY of the aboriginal Americans has been studied both from the observational and the deductive side. Omitting the latter for the present, it may be pleasant to gather what was known about—

1. Counting, numbering, and the multiplication table.
2. Weights and measures, as they are termed in the arithmetics.
3. Money and the mechanism of exchange.
4. Calendar and clock time.

These ancient manufacturers and builders had no government standards of measuring their work, but referred everything to their bodies. This system was far more accurate among rude peoples, where anthropometric differences between the sexes and between individuals were very slight. Many witnesses confirm the opinion that every weapon or chunkee pole had its proportion to the owner. Dr. Mathews says that the Navajo pole for the great hoop game was twice the span long, and Mr. Dorsey found that the Omaha arrow had to measure from the inner angle of the elbow to the tip of the middle finger, and thence over the back of the hand to the wrist-bone. I have examined many hundreds of quivers, and have always found the arrows to be of the same length, while those of the tribe resemble in general appearance, but vary slightly in length for each man. Dr. Dorsey found the Naltunne, on Siletz Agency, in Oregon, using the double arm's length, the single arm's length, half the span, the cubit, the half cubit, the hand length, the hand width, the finger width (1, 2,

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3, 4, 5), and from the tip of the elbow across the body to the end of the middle finger of the other hand. In most of these cases the starting-point is the meeting of the tips of the thumb and index finger. (*Science*, N. Y., 1892, xx, 194.)

Among the Aztecs, or Nahuatls, and the Mayas, the two most cultivated stocks of North American aborigines, Brinton finds no words for estimating quantity by gravity, no weighing terms. For extension, the human body, and, largely, the hand and the foot, furnished standards of measuring. Among the Mayas the footstep or print, or length of the foot, was very familiar, and frequently in use by artisans, as well as the pace or stride.

Quite a series of measures were recognized from the ground to the upper portions of the body, to the ankle, to the upper portion of the calf, to the knee-cap, to the girdle, to the ribs or chest, to the mammæ, to the neck, to the mouth, to the vertex. Other measures were the hand, finger-breadths, the span, half around the hand, as in measuring for a glove, the cubit, the fathom. Journeys were counted by resting-places.

In Aztec metrology the fingers appear to have been customary measures. The span was not like ours, from the extremity of the thumb to the extremity of the little finger, nor the Cakchiquel, from the extremity of the thumb to that of the middle finger, but like that now in use among the Mayas, from the extremity of the thumb to that of the index finger.

There were four measures from the point of the elbow: to the wrist of the same arm; to the wrist of the opposite arm; to the ends of the fingers of the same arm; to the ends of the opposite arm. The arms are extended always at right angles to the body.

The Aztec arm measures were from the tip of the shoulder to the end of the hand; from the tip of the fingers of one hand to those of the other; from the middle of the breasts to the end of the fingers. The *octocatl*, or "ten-foot pole," approximately, was the standard of length employed in laying out grounds and constructing buildings.

The road measure of the Aztecs was by the stops of the carriers, as in Guatemala.

The Aztecs were entirely ignorant of balances, scales or weights. The plumb line must have been unknown to the Mexicans also.*

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*D. G. Brinton, *Essays of an Americanist*, Phil. 1890, 433–451. This whole paper should be consulted. Charles Whittlesey, *Metrical Standards of the Mound-builders.*

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A curious fact in engineering is recorded by that most careful of observers, Rev. J. O. Dorsey, regarding the Omaha tribal circles. He says: "The circle was not made by measurement, nor did any one give directions where each tent should be placed; that was left to the women. Though they did not measure the distance, each woman knew where to pitch her tent." She also knew the proper distance apart for safety on the one hand, or for the convenience of dressing hides on the other.*

Dorsey tells me the Peruvians had elegant balances.

Federal money and the metric system, as applied to the mechanism of exchange, are modern returns to very primitive modes of reckoning values. The basis of money is at times a shell, a bead, a robe, a skin. The purchasing power of the unit is fixed in each case, and among certain tribes there is a table of moneys, such as: two elks' teeth equal one pony, eight ponies equal one wife.†

The day's journey is often mentioned as a fixed distance. This is only true within wide limits, and it scarcely ever exceeds ten miles for marching.

"The Indians, finding that their wives were so near as to be within one of their ordinary days' work, which seldom exceeded ten or twelve miles, determined not to rest till they had joined them."‡

The Zuni Indians know well that the light of the rising sun falls on the same spot but two days in the year, and that at noon the shadow of a pillar lengthens and then shortens back to the same spot in the same period. They have a pillar dedicated to astronomical observations. On many houses in the pueblo there are scores on the wall, opposite windows or loop-holes, for the purpose of recording the movements of the sun. There are also pillars to be seen in other parts of the world which could possibly be dedicated to the same end, since such a feat is performed by at least one tribe. This reminds one of the old familiar cuts on the kitchen window-sill in almost every country house.

"Each morning, just at dawn, the Sun priest, followed by the master priest of the Bow, went along the eastern trail to the ruined city of Ma-tsa-ki by the riverside, where, awaited at a distance by his

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*Dorsey, III. An. Rep. Bur. Ethnol., Wash., 1883, pp. 219–220.

†Stearns, *Ethno. Conchology*, Rep. U. S. N. Mus., 1887, with bibliography Also Cushing, *Am. Anthropologist*, Wash., 1892, V.

‡Hearne, *Journey*, etc., Lond., 1795, Strahan, 185.

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companion, he slowly approached a square open tower, and seated himself just inside upon a rude ancient stone chair, and before a pillar sculptured with the face of the sun, the sacred hand, the morning star and the new moon. Here he awaited, with prayer and sacred song, the rising of the sun. Not many such pilgrimages are made ere the suns look at each other, and the shadows of the solar monolith, the monument of Thunder Mountain, and the pillar of the gardens of Zuni lie along the same trail; then the priest blesses, thanks and exhorts his father, while the warrior guardian responds as he cuts the last notch in his pine-wood calendar, and both hasten back to call from the housetops the glad tidings of the return of spring. Nor may the Sun priest err in his watch of time's flight, for many are the houses in Zuni with scores in their walls or ancient plates embedded therein, while opposite a convenient window or small porthole lets in the light of the rising sun, which shines but two mornings of the 365 on the same place. Wonderfully reliable are these rude systems of orientation, by which the religion, the labors, and even the pastimes of the Zuni are regulated." *

I have heard that the Montagnais hunters, in going along, stand sticks upright in the snow at points agreed upon, and make a scratch where the shadow lies. The women, coming after, observe the angle between the scratch and the shadow, and by the size of the angle determine their pace to the next station. It would be interesting to know whether the men or the women devised this primitive clock.

The evolution of machinery cannot be ignored in this connection. A machine is a contrivance for changing the direction and the velocity of motion or force. It cannot create force any more than a tool can. On the contrary, it consumes a vast amount of force in its own working. By means of a tool the entire force exerted is brought to bear upon the material. The machine, by the waste of a portion of the force, enables the workman to apply his efforts more rapidly, more powerfully, or in ways unattainable by hand.

All power at first was hand-power; the machinery of the world was moved only by human muscles. In the chapter on animals will be treated the gradual enlistment of domestic beasts in the service of man. Besides these, winds and water currents gradually have been

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*F. H. Cushing, *Century Magazine*, quoted in *Nature*, Lond., 1892, Mar. 17, p. 464.

Time of day among the Navajo, see Matthews, *Mountain Chant*, V., An. Rep. Bur. Ethnol., 389.

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domesticated for human uses in savagery. The study of these is essential to a knowledge of industrial progress.

The Zuni woman's extremely simple potter's wheel, which is nothing more than the turning of her vessel about in a box of dry sand as the work goes on, is only a little more rude than the fashion in the interior of China of putting a lump of clay on the top of a revolving shaft which they turn with one hand while the pot is formed with the other.

"The potter's wheel was known in the world from high antiquity. The Africans push a mass of clay around with one hand and form it with the other. The Egyptian potter turned the wheel by hand. The Hindu potter goes down to the riverside when a flood has brought him a deposit of fine clay, where all he has to do is to knead a batch of it, stick up his pivot in the ground, balance the heavy wooden table on the top, give it a spin and set to work." *

The spindle with its whorl is a free wheel and axle with the principle of the flywheel fully developed. The twister, well known to savages, is a still simpler flywheel. The Zuni Indians make a block of wood about 8x3x½ inches. Near one end a hole is made, ¾ inch in diameter, and the stick is notched just outside this hole. This is the flywheel. A stick with a head cut on it is thrust through the hole and serves for a handle. One end of the material to be twisted is tied to the notch on the flywheel, and the other end to some fixed object. The twister holds to the handle and causes the fly to revolve by the motion of the hand.

"It is extremely probable that the first continuous motion was employed in connection with the grinding of corn." †

In this same connection Shaw arranges his corn-grinders as follows: 1. Simple stone pounder. 2. Mortar and pestle, worked (*a*) by slaves, (*b*) by bondmen, (*c*) by cattle. 3. Flat cylindrical stone with vertical spindle. But, in reality, there have been two series, the mortar series and the grinding series, the order of which last would be: 1. Rubber and flat native rock. 2. Metate and muller. 3. The rotary mill, driven first by hand and after by animals, winds and water.

The utilization of the wind in locomotion will be studied in the chapter on primitive transportation. The Indians of the plains, who

* Tylor, *Anthropology*, N. Y., 1881, p. 275.

† Shaw, J., *Soc. Arts.*, Lond., 1885, XXXIII. 395.

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dwelt in skin lodges, understood the use of the fly and extra pole on the tent to utilize the wind in creating a draft and drawing the smoke out of the dwelling. The sail is also used in the Arctic regions to aid driving the sled over smooth ice. But no savage had any conception of a windmill or invited the air to participate in doing mechanical work.

If we were permitted to coin a word, we should call all the arts combined that relate to the getting, preserving and utilizing of water, hydrotechny; but that would furnish rather a long term for the study of these arts,—hydrotechnology,—though it is not lacking in euphony. The spring, the well, the city reservoir and waterworks; the open stream, the canal, the locomotive; the tide wheel, the overshot, the turbine—all of these indicate progress in hydrotechny as related to aliment, to transportation, to irrigation and to manufactures. The world's progress has followed the water, and water has never been absent from men's minds.

No aborigines, unaided by domestic animals, have displayed so much patience and ingenuity in the storage and conducting of water as the Indians of the arid region of the United States. Throughout the public region, says Mr. Hodge, works of irrigation abound in the valleys and on the mountain slopes, especially along the drainage of the Gila and the Salado, in Southern Arizona, where the inhabitants are engaged in agriculture to a vast extent by this means. The arable tract of the Salado comprises 450,000 acres, and the ancient inhabitants controlled the watering of at least 250,000 acres. The outlines of one hundred and fifty miles of ancient main irrigating ditches may be readily traced, some of which meander southward a distance of fourteen miles. In one place the main canal was found to be a ditch within a ditch, the bed being seven feet deep. The lower section was only four feet wide, but the sides broadened in their ascent to a "bench" three feet wide on each side of the canal. Remains of balsas were recovered, showing that the transportation of material was also carried on. Remains of flood gates were found by Mr. Cushing, and great reservoirs for storage of water, one example being 200 feet long and 15 feet in depth.*

In the earliest ENGINEERING feats two facts must be sharply kept before the mind, to-wit: That time was no object, and that there were no private buildings. Suppose that every laboring person in Chicago should be immediately withdrawn from all private work, and that they

* F. W. Hodge, *Am. Anthropologist*, July, 1893, pp. 323-330.

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all should be organized to labor for ten years upon some government building as a memorial of the city's grandeur. One million hand laborers would erect a pyramid containing fifteen thousand milliards of tons of earth, and the mechanics would put on the top of it a structure larger than all the monuments in Egypt combined.

The only puzzle the modern student can have is to conceive how the ancient engineer lifted these great weights. If he could lift them he could move them. If was within the ability of a company of American Indians in several areas to hammer down any great stone into any form. It was customary for them, as tribes, to all engage in the same operation in hauling logs, or seines, or boats, or stones, in rowing and dancing. The problem is somewhat like that of Archimedes. "Given a rope long enough and a crib work strong enough," and any modern savage people will undertake to set up the monuments of Brittany. In point of fact the ancient Americans did quarry single stones weighing three hundred tons, did move them great distances and set them in place. In the copper mines of Michigan was discovered a huge nugget of copper resting still on a mass of cob work. Around were wedges and mauls, and, by means of shoving up alternate sides after lifting them by wedges, the engineers had hoisted the mass twenty-six feet. This is the only historic example I have found of actual work done, and here I leave the American aboriginal mechanic.

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ARCHÆOLOGICAL RESEARCHES IN THE CHAMPLAIN VALLEY.

BY G. H. PERKINS.

THE Champlain Valley, though of comparatively inconsiderable area and containing neither mounds nor extensive village sites, has nevertheless yielded to diligent search many objects of considerable archæological interest.

It is not the design of the writer to give any detailed account of the numerous specimens which have been found in the Champlain Valley. For such accounts those interested are referred to sundry articles published elsewhere,* in which many of the objects to which allusion is here made are fully described, and many of them figured.

In the present paper it is intended to present in as general a manner as possible the results of more than twenty years' investigation in the region under consideration.

As to the age and origin of most of the specimens, little that is certain can be said, although we may be tolerably sure that most are of no very great antiquity, but were made and used by the Algonkins and Iroquois, who occupied the country when first visited by Europeans. Continually at war with each other, and, in some respects, widely different as were these two peoples, they were nevertheless quite similar in the routine of their daily life, and the implements, ornaments and weapons of either one do not appear to have been very unlike those of the other.

At any rate, I have not found it in any way practicable to distinguish those specimens which belonged to one from those of the other as they occur in our collections.

And yet, when we compare the specimens of the Champlain Valley with those from other parts of New England on the one hand and with those from New York and the West on the other, we see very clearly that archæologically, the Champlain Valley belongs with New

*_American Naturalist_, Vol. V., page 11; Vol. XIII., page 731; Vol. XV., page 426; Vol. XIX., page 1143; Vol. XX., page 333. _Proc. A. A. A. S._, Vol. XXII., page 76; Vol. XXV., page 325; Vol. XXVII., page 312. _Science_, Oct. 17, 1892.

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York and the West rather than with New England and the East. That is, the stone, bone and metal objects which we have collected resemble far more closely those which are undoubtedly Iroquois than they do those which are Algonkin, and for this reason our specimens are more varied in form and more elegant in workmanship than those found in any other part of New England.

In many localities, notably the Mississippi Valley, finely wrought objects are much more abundant than they are in this region, but, though fewer, our specimens are not in any wise inferior in quality.

Most of the types of stone implements found in the United States are more or less completely represented in the Champlain Valley, many of them very exactly. In looking over a large collection gathered from either side of the lake, one is constantly reminded of typical specimens from the Ohio mounds, the graves of Tennessee, the shell-heaps of Florida, and even the common forms of the Pacific coast. Of course, much of this resemblance is due to the same cause as is that found all over the world, the common result obtained by the exercise of common skill and ingenuity working in a common material, which gives us stone implements which are, in a general way, similar wherever found, and by whomsoever made. But it is more than this, for it is not so much in the rude and common implements that we find our close resemblances as in those of finer finish, and we must conclude, both because of the material as well as of the form, that an extensive interchange of objects by barter or the fortunes of war, or both, was carried on by the aborigines in the Champlain Valley, as we know it to have been in other parts of the country.

This interchange of objects by tribes occupying different parts of the country is abundantly shown by the presence of points, knives and the like, made from the brightly hued agates and jaspers of the West, by those beaten from the native copper of Lake Superior, by beads of shell and coral from the South, and by the presence of other materials not found in the region.

Copper beaten into points, knives, bars or sheets is found, though not abundantly, and there is one gouge of this material. More sparingly used and apparently only for ornament was shell, of which material beads of different sorts were made. Coral beads have also been found in one or two localities. It seems most probable that bone was often used for the manufacture of awls and similar implements, though very few objects made of bone have been found. This may be explained by the conditions of soil, and especially climate, to which

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all our relics have been exposed, and which must have been very unfavorable to the preservation of a substance like bone; so that, although bone implements were in common use among the tribes formerly occupying the Champlain Valley, they have for the most part disappeared through decomposition.

The statements made to Champlain by his Algonkin companions in 1609 that, because of long-continued warfare between themselves and the Iroquois, the borders of the lake to which his name is given were not and had not for a long time been permanently inhabited, are verified by the almost entire absence of ancient village sites. With not more than two or three exceptions, we find evidence throughout the valley of camp sites rather than village sites, of occupation for a season rather than for years.

Very much might be said of the pottery of the Champlain Valley, but without the aid of abundant illustration it is not easy to give a clear idea of its great variety and real artistic quality. It is very noticeable that the resemblance of specimens from the Champlain Valley to specimens from the interior, the South or the Pacific coast, often so exact as to become identity in the case of stone implements or ornaments, almost disappears in the earthenware.

Fragments of earthenware are not at all uncommon in the area we are studying, though entire jars are very rare, but among all the multitude of these fragments we find little that resembles the pottery of the West. As will be seen later, the decoration is almost endlessly varied, but it is not the decoration of the pottery of the mounds or graves of other localities. No single example of the animal forms of the mounds, no bit of colored or painted ware has been discovered.

If judged by their earthenware alone, the tribes of the Champlain Valley would undoubtedly be regarded as quite distinct from those of the West, while, if we use all the rest of the relics which they have left as the basis of comparison, the difference does not seem to be great, as it was not. Although for the most part in fragments, the specimens of pottery found are amply sufficient to show the form of the entire jars and the character of their decoration. No one, I am sure, can examine a considerable collection of these pieces of earthenware without realizing the fact that the makers were exceedingly skillful, both in the treatment of the unbaked clay and in its final ornamentation, and gifted with no little artistic taste.

The form of the jars is readily understood from the few entire specimens and from the many large fragments. It was always glob-

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ular, or in rare instances sub-conical, but the upper portion is not always circular, since in quite a number of examples the rim is quadrangular, or in very rare cases polygonal. These more elaborately shaped jars are always very elaborately ornamented and are to be regarded as the finest specimens of earthenware found in the region.

The paste used, a mixture of pounded stone, quartz, mica, feldspar, and sometimes other materials, with clay, was of very variable nature, now being very fine, now with larger bits of stone, now very coarse. Some of the pottery was burned until it was almost black; most is dark red; some so light that it seems to have been but little exposed to the fire. The figures used in decorating were neither numerous nor complex, being always impressed upon the soft surface of the unburned jar and consisting of either lines of different width and length, or of small figures, such as circles, triangles, pits, squares, crescents and the like. Dentellated and zigzag figures were used, and stamps an inch or more long were made by which the impression was produced.

Although the number of distinct figures used was not large, yet by combining them in different ways almost endless diversity was produced in the patterns. The decoration is sometimes exceedingly delicate and regular, though, of course, in other examples it is ruder and coarser. In some jars the ornamentation is confined to a narrow band about the rim, while in others the entire surface is covered with lines and figures drawn on the curved surface with surprising regularity. Some jars are not only adorned on the outside, but there are lines and even figures on the inside. The rim, too, is not always left plain, but may be scalloped very nicely. A favorite style of ornament appears to have been a complex grouping of lines drawn in different directions, horizontal, oblique, vertical, etc.

Besides jars, pipes were also made of earthenware, and for this purpose the finest material was used. These pipes are, some of them, shaped much like the modern clay pipe; others are straight tubes flaring at the larger end.

In a region where the manufacture of pottery was so commonly and so extensively carried on, we should expect to discover the ancient kilns in which it was burned, and so we do, in one locality at least. Just north of Plattsburgh, on the lake shore, is a ridge of sand where, with my friend Dr. Kellogg, I have found a number of undoubted kilns in which pottery was burned, as the numerous clusters of burned stones, masses of burned clay and a very great number of bits of pot-

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tery amply prove. From this place Dr. Kellogg has taken several bushels of fragments, some of them of large size, and has been able to restore two jars entirely

Where pottery was so abundant it would seem to be a waste of labor to manufacture dishes of stone, and such are very rare in this region; but a few have been found. Steatite is found in many parts of the Champlain Valley, especially on the Vermont side, and this material was now and then used for the making of shallow dishes of no large size. They were usually well finished, and, in at least one instance, even ornamented by raised figures on the outside.

Slate of various shades of red, green, purple, brown or black is common in Vermont, and, as would be expected, a material so excellently adapted to the purposes of the worker in stone was not overlooked. Not only was it used for making gorgets, two-hole stones, banner stones and the like, but even points, knives and scrapers were also sometimes made of slate. Indeed, one of the most characteristic objects which is found is a form of slate knife not unlike those of quartz in outline, which is long, triangular, or even linear in outline, the surface ground, not flaked, smoothly finished, often polished, and with a straight stem or haft, along each side of which are several notches or scallops. Some of these knives are so long—five or six inches—and so slender that they seem wholly incapable of any service, and their purpose is quite uncertain.

Perhaps no other class of specimens so well illustrates the skill of the worker in stone as do the pipes. While, as compared with the many superb pipes which the mounds of the Ohio and Mississippi Valleys have afforded, those from the Champlain Valley may appear very insignificant, yet a by no means contemptible collection has here been obtained. Our pipes are not equal in either elaborateness of design or variety of form to those from the localities named, but, though plainer and simpler, they are not at all inferior in regularity of form or perfection of finish. The most important of our pipes are the very few which are carved to represent animals, and especially two which are ornamented with carved human faces, the latter being the only specimens of any sort in our collections in which an attempt is made to imitate any part of the human body.

I do not know that the material of the Champlain pipes differs from that used in other places. It is, naturally, stone not very hard, of attractive appearance, and capable of receiving a polish. Steatite, gypsum, limestone, slate, were most often chosen for this purpose.

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Besides platform, bell-shaped, trumpet-shaped and other common forms of pipes, there occur straight tubular pipes very much like those of the Pacific coast. This may even be regarded as our most common form, for there are many more tubular pipes than there are of any other single form, though not by any means more than of all other forms. In length these straight pipes vary from two or three inches to twelve or fifteen.

Most of the usual forms of what are known as ornamental or ceremonial objects, such as bird-shaped stones, banner stones, two-hole stones, pendants, and so on, are found in the collections from the Champlain Valley. Some of the handsomest of these are of banded slate, but much harder stone was often used, granite, porphyry, greenstone, or quartz. Whatever may have been the design of these objects, no labor was too great, no polish too fine to satisfy the makers.

Discoidal stones, rare in the East, are sparingly found in the region we are studying. A few of these are very finely made and polished, but many more are rude and poorly finished.

The usual kinds of celts are found commonly, and I do not think that we have any very peculiar forms. Our celts are most often rather long and slender, though short and clumsy specimens are not wanting. Some of them have each end ground to an edge, and the transition from celt to gouge, or hollow chisel, is seen in a few specimens which are celt at one end and gouge at the other.

Probably nowhere does the gouge occupy relatively so important a place in archæological collections as in the Champlain Valley. Here it occurs of many forms and sizes, and is excelled in beauty of material and elegance of workmanship by no other class of objects, at least when only the best examples are considered. Indeed, so perfectly are some of our gouges made and finished that it is difficult to believe that they were ever intended to be put among the common implements of everyday life.

I do not at all suppose that the greater part of the gouges, certainly the ruder ones, were for other than the most utilitarian purposes, but those which are of most perfect form, of the same handsome stone as that of which amulets and such undoubtedly ceremonial objects were made, and moreover showing no sign of use, though not of the hardest material, it seems to me more reasonable to regard as ceremonial rather than simply useful objects. Some of the finest gouges are large, twelve to fifteen inches long, and in a few cases more, the longest which I have seen being nineteen inches long; but

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the other proportions do not increase with the length, as nearly all the long gouges are quite slender. The individuality which is noticeable in all the better specimens of stone implements is especially manifest in the gouges. Scarcely any two are exactly alike, and it is not often that two can be found that can fairly be regarded as duplicates.

As on the one hand the celt passes into the gouge, so on the other it develops into the grooved axe. Apparently, the early inhabitants of the Champlain Valley had very few axes of this sort. At any rate, few have been found. Most of them are very well shaped and smoothly finished, though very rude specimens occur. A few are very small, mere little hatchets, and none are large, the heaviest as compared with axes of the South and West being not more than of medium size.

The mortar and pestle, so important in the household economy of all Indian tribes, are not lacking in our collections. The mortars were generally rude, little more labor having been expended upon them than was required to excavate a shallow depression, though sometimes the whole was more or less worked out, the result being a mortar much like those common on the Pacific coast. The pestle, however, though sometimes rude, was more often carefully hammered into shape, and even polished. In a few cases the one end was carved to resemble the head of an animal, four such pestles having been found. It is quite probable that the longest and best-finished pestles were not designed as such, but were to be used as clubs. Several of these are over two feet long, and one is twenty-nine inches.

It goes without saying that, numerically, the larger part of our collections is made up of flaked or chipped implements. Not only points and such like objects, but even celts and other tools which, in most cases, were picked and ground, were occasionally flaked. Some of these recall the ordinary Danish celt. Flaked celts or axes are, however, very seldom found, and they were always ground more or less after the general shape was produced by flaking.

As it is everywhere, the usual material of flaked specimens is some of the many varieties of quartz rock, though other hard stone was sometimes used. A bluish or grayish quartzite which is found in place in Vermont was more often chosen than any other material, and in some localities nearly all the points, large and small, are of this stone, and the most frequently occurring form is triangular, with a slightly indented base. It is noticeable that the white, milky quartz, so often used in Southern New England and elsewhere, very rarely

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occurs in this region. The triangular point mentioned above is found in every variety of size and proportion from little points not more than half an inch long to those that are four or five inches in length. It will, of course, be understood that this form is not the only one found here, but that, while this is most common, nearly, and I think quite, all the forms which have been found in other parts of the United States have also been found in the Champlain Valley, excepting perhaps certain unique specimens.

Our collections of points, knives, etc., as a whole, do not, indeed, present as showy and attractive an appearance to the observer as do many similar from the Mississippi Valley or the West, but the main difference is that in the latter finely-made specimens, of beautiful material, are common; in our collections such are not common, but they do occur, and as fine as can be found anywhere: *i. e.*, in the Western collections there are many splendid examples of chipped objects, while in our own there are few, but what we have are every whit as excellent. Obviously a detailed account of the specimens of this class is utterly outside of the plan of this paper. It is sufficient to mention the points, large and small, knives, scrapers, drills, and so on.

Certain very large flaked objects, ovate or leaf-shaped, are believed to be agricultural implements. Some of these are very nicely made, but they do not equal in either size or finish similar specimens found in the Mississippi Valley.

In the early part of this paper it was stated that probably most of the objects found in the Champlain Valley should be referred to the Algonkin and Iroquois occupants of the region when it was first entered by Europeans. This may be true of all, since we have at present no means of ascertaining how long these tribes had lived in the lands bordering the lake. There are, however, a few localities in which a considerable number of articles have been discovered under circumstances which indicate—I think I may say prove—very much greater antiquity of origin than could be claimed for most of the objects obtained. In one instance very rude flaked specimens of the turtleback order were taken from undisturbed subsoil several feet below the surface.

In conclusion, I may only add that by far the larger part of the specimens which have been found in the Champlain Valley—at any rate, of those which have been preserved—are to be seen in the Museum of the University of Vermont at Burlington, and in the very fine collection of Dr. D. S. Kellogg, of Plattsburgh, N. Y., though there are smaller collections at the State Capitol at Montpelier and in the possession of a few individuals.

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ANTHROPOLOGICAL WORK AT THE UNIVERSITY OF MICHIGAN.

BY HARLAN I. SMITH.

THE beginning of the second semester of the college year 1891–'92 marked a new departure for Anthropology at the University of Michigan. For several months an interest in this study, especially in the branch of American Archæology, had been ripening. Those interested had been discussing matters relating to the various subjects in which they were most absorbed. Collections of specimens and photographs were examined in connection with these private conversations. Papers on various topics of popular interest were given before the Geological and Philological Societies of the University. And it was found that the University was in possession of several important collections of archæological material, which were stored away, and which were so interesting and instructive as to merit a better place. At this time it was contemplated to arrange these collections in the University Museum. Prof. F. W. Kelsey, of the Latin Department, who had carried on explorations in Rome, and who was greatly interested in Roman archæology, was most active in urging the cause. He insisted that the materials should be worked up for exhibition and that the complete data be recorded, from such labels, letters and notes as were at hand, before there was a possibility of any loss of facts. He further urged that mounds, village sites and other primitive remains of the State in danger of destruction be examined in a careful and scientific way, before any commercial enterprise necessitated their obliteration.

It was in this way that matters stood when, at the beginning of a new semester, Prof. Kelsey was empowered to offer a course in "Museum Work in American Archæology." The Geological Department kindly turned over one of their rooms as a laboratory for the work, and later in the year proper cases were constructed in the west end of the lower hall of the Museum for the exhibition of specimens and photographs, and such specimens as were ready for exhibition were deposited in them.

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H. C. Markham and myself were the only students to avail themselves of the opportunity for museum work. Mr. Markham devoted his attention to literary work until towards the end of the semester, when he began investigating the manufacture of chipped implements and the processes of drilling without the use of metal. In these investigations he was fairly successful, and gave the results of his work in a paper before the Geological Society, illustrating his subject by chipping several forms from glass and by perforating pieces of slate by means of a soft pine drill with sand and water. All the archæological materials not previously arranged for exhibition were taken to the laboratory, and it was then found that the Department was in possession of a much more valuable collection than was at first supposed. One of the most interesting and instructive features of this is a typical lot of about forty neolithic implements from Denmark. Among the materials illustrating the ceramic art is a series of potsherds and pottery vessels collected by Dr. J. B. Steere about twenty years ago. Of these a number are from the large islands at the mouth of the Amazon; still more are from Ancon and Pacasmayo, in Peru, and not a few were obtained in the East Indies. The texture and ornamentation of all of these is very interesting. But time will not permit a description of them at this place. Suffice it to say that over fifty of the vessels that were badly broken have been carefully restored. There were also a few specimens illustrating the archæology of Michigan.

Since the establishment of the laboratory a series of stone hammers from the prehistoric copper mines on Isle Royal, Michigan, were presented by Prof. Sherger, and the citizens of Ann Arbor subscribed for the purchase of a local collection of stone implements known as the De Pue collection. Besides these additions, a series of over one hundred plaster casts of implements and other prehistoric objects in the Smithsonian Institution was presented to the Museum. These casts were used to great advantage in illustrating a number of lectures before the classes in history.

Later in the year a number of village sites were discovered and examined in a preliminary way, and an extensive survey was made of one of the so-called "garden beds" near Kalamazoo, under the direction of the department.

So rapid has been the accumulation and arrangement of materials that the cases constructed are now entirely inadequate, and new cases are about to be built to accommodate several collections that have been

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promised, and to make room for photographs and diagrams from the laboratory. It is desired to make collections illustrating American archæology when accompanied by the necessary data, in regard to the locality where, and the conditions under which, the specimens were found, as rapidly as possible, and collections without such data, and hence with less scientific value, must be sacrificed for these. Original research is to be encouraged and a rigid adherence to scientific methods is to be followed in order that the new department may not fall to the level of a museum of curiosities instead of holding to its original purpose.

Michigan is a field as yet comparatively unexplored, and it is hoped that it may be carefully and scientifically surveyed, so that the results will be of value to science. As yet the work has been almost exclusively confined to archæology, but as the department develops it is expected that the other important phases of anthropological science will receive attention.

So we may say, I think, that another university, and one in the West, has taken up this important line of investigation.

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THE ANTIQUITY OF THE CIVILIZATION OF PERU.

BY EMILIO MONTES.

LES idées vraies ou fausses se développent selon le milieu où elles se trouvent, lequel leur en impriment un caractère tout spécial d'originalité.

L'homme croit être en possession de la vérité quand même il s'egaré par l'erreur la plus grossière.

Ah! Et combien de temps lui faudrat-il pour qu'il en revienne, pour qu'il reconnaisse et abdique de ses erreurs, de ses égarements et de ses surprises?

Les années et les siècles courent précipitament dans l'abîme du néant, et sous l'influence du temps la terre et tout change; mais l'erreur change très difficilement.

C'est ainsi qu'aujourd'hui on pense que la region la plus ancienne d'où s'irradièrent les premiers rayons de civilisation en est l'Egypte—venant immédiatement après l'Inde. Mais si nous rencontrons, par tout ailleurs, de travaux embrionaires, si nous trouvons des monuments vraiment primitifs avec ce cachet indélébile de la plus haute antiquité et revelant dans tout son ensemble l'existence d'un peuple, nous devons proclamer la civilisation de ce peuple, certes, après un sévère et mûr examen, comme antérieur à la civilisation Indienne et Egyptienne.

L'étincelle que jaillit sous la main de l'ouvrier en posant la dernière pierre qu'accomplissait le faîte de son mûr cyclopéen, nous la voyons encore phosphorescente à la silhuette majestueuse qui se détache au fond obscur des milliers d'années qu'entourent les vastes et immenses monuments du plateau du Kuzko.

Rompre avec la croyance et l'idée générale qui règnent de nos jours c'est quelque chose de fort, c'est peut-être aller contre le courant. Sombrerons nous?....

Le motif du présent travail est tout simplement de soumettre à votre considération l'idée que j'ai du Pèrou préhistorique, du Pèrou pris comme le premier point archéologique d'où s'irradièrent les premiers rayons de civilisation et du progrès. La science nous rendra de vrais et positifs services; elle nous faira voir tout claire-

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ment que le Pèrou, comme je viens de dire, en est le premier peuple qui donna son premier pas dans la voie de la civilisation et du progrès sur cette terre que nous habitons.

En dehors de toute croyance soit religieuse ou non, mais qui empêche de voir les choses comme elles doivent être vraies, nous déduirons cette civilisation des objets qui nous ont laissé et que nous avons devant nous, et particulièrement de l'examen de ceux grandioses et surprenants monuments muets parcequ'ils n'en ont pas aucune écriture; mais parlants, parcequ'ils en disent plus que les caractères inventés un peu plus tard par l'homme lui-même pour matérialiser sa pensée et pour qu'elle en fut comprise et gardée en différents lieux et temps.

Pour entrer franchement sur le sujet qui nous occupe il faut que nous fassions une étude rétrospective de ce qu'était l'homme à ses premiers jours. Evidemment, que l'être de raison n'avait pas encore développé ses facultés comme dans ces derniers temps; non, la sensibilité, plus qu'aucune autre faculté, jouait dans ces moments-là un rôle important; plus tard c'est l'intelligence s'harmonisant avec la sensibilité qui president tous ces actes; la raison, avec tout son éclat, viendra plus tard et métrissera et sa pensée et tous ces actes.

II.

L'homme ne peut pas rester tranquille parcequ'il a en lui le germe d'une activité qui tire son origine de Dieu lui-même; mais il lui faut de moyens pour qu'il arrive à se développer et à réaliser sa destinée. Il se mettera donc à chercher les moyens qui doivent satisfaire ses nécessités.

C'est donc à l'imperfection de la nature humaine que nous retrouverons l'origine du travail; par conséquent ce n'est pas un châtiment comme nous fait connaître la tradition mosaique; c'est tout simplement l'homme s'enquirant de moyens pour accomplir sa destinée.

Par le travail l'homme a maitrisé la terre et tout ce qu'elle en contiens. Doué d'une nature périssable, mais doté d'un principle de vie, il a voulu que ses œuvres défiassent et la mort et les temps. Et ses songes et ses désirs se sont accomplis! Car ces monuments et ces objets construits il y a au moins 70 siècles nous les voyons encore debout.

Sur les fronts de ces anciennes constructions et à ses pieds nous retrouverons encore, et les empreints et les traces des générations

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qui ont passé comme nous passerons bientôt à la region éternelle des ombres, laissant derrière nous des glorieux souvenirs, que les nouvelles générations sauront profiter.

C'est aussi à ces monuments que nous nous adresserons, car ils en contiennent beaucoup de précieux renseignements à nous donner.

III.

Les monuments et les objets sortis des mains de l'homme primitif au Kuzko sont presque tous décorés de serpents, divinités de ces temps vraiments préhistoriques, où l'homme effrayé et épouvanté par l'hideuse figure de ces animaux, il les a cru supérieurs à lui, et connaissant sa faiblesse ou sans la connaître, éleva dans son cœur d'une manière instinctive un autel où expontanément rendu son culte à ces êtres horribles, qui les croyait de beaucoup supérieurs à lui; croyance qui porte avec soi la faiblesse humaine, origine de toute religion.

Mais ce cult devait revêtir une forme extérieure, et c'est pour cela que nous voyons sur ces monuments-là et sur ces pierres-çi les serpents, qui ne sont autre chose que les monstres horribles qui remplissaient de terreur et d'épouvante les esprits naïfs des premiers habitants de la terre.

Quand l'homme connût dans tous ses détails cette terre que nous habitons, quand il eut conscience et certitude que sur cette planète n'existait pas d'autre être supérieur à lui, alors, proclama sa royauté, fonda sa dynastie et s'appela "Roi de la Création." Ensuite, il oublia en rougissant de honte sa première religion et en prit une autre.

IV.

La religion qui avait pour mythe le serpent se répandit dans tout le monde. D'abord, elle s'irradiat au Nord du Pèrou (Colombie), puis au Nord (Amérique Centrale et Yukatan), jusqu'au Mexique, là elle fit hate et elle avait déjà des caractères pour instruir avantageusement le peuple. Après, en passant par ce territoire et comme un souvenir du triomphe de la religion du serpent dans tout ce continent et pour marquer le passage en Asie, bâti son adoratorio serpent, lequel fût conservé tout dernièrement par les efforts de l'infatigable et distingué savant Prof. F. W. Putnam.

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V.

Comme nous venons de dire, l'architecture au Mexique est déjà parlante. Et les temples et palais, les obelisques et jardins suspendus épars ça et là au grand plateau du Kuzko, se reproduisent en mieux et sous un cachet d'originalité au plateau Mexicain, où la pyramide s'ébauche pour la première fois dans l'atelier de l'être pensant. Plus tard et plus loin il reconstruira de nouveau, mais avec un fini d'art qu'aujourd'hui même nous voyons émerveillés ces imposantes constructions au plateau d'Iran, à la vallée de l'Indus, aux plaines de Ghizeh, tout près de Memphis, à Thèbes, à Babylone, à Séleucie et tant d'autres villes et contrées où l'art arriva à donner son dernier coup de perfectionnement aux travaux ébauchés au grand plateau du Kuzko, reproduis de mieux en mieux et avec un certain cachet d'originalité jusqu'au plateau Mexicain.

VI.

Au Pèrou nous trouvons de monuments et d'objets en pierre —ils n'ont pas aucune écriture parcequ'ils ont été bâtis par l'homme primitif, par l'homme qui n'avait pas encore songé à manifester ses pensées par le moyen de l'écriture, fusse phonétique, cuneiforme ou hiéroglyphique, et par cela même nous en concluerons: que ces monuments sont bien plus anciens que ceux de l'Inde et de l'Egypte, car il font voir et par l'écriture et par les hiéroglyphiques qu'ils en contienent à l'homme déjà bien avancé sur le chemin de la civilization et du progrès.

Dans ces deux contrées, l'Inde et l'Egypte, nous entrons de but en blanc dans une civilization qui n'a rien d'embrionaire, pendant qu'au Pèrou, c'est tout le contraire, nous voyons un peuple primitif qui fait son premier ouvrage sur lequel il a mit en relict son premier Dieu, le serpent.

C'est donc au Pèrou que nous trouverons les monuments les plus anciens qui existent au monde, c'est là qui raillit pour la première fois l'étincelle de la civilization qui grandira dans les temps par l'effort des générations. C'est aussi au Pèrou, si nous jetons un regard avide, que nous trouverons la plus vieille race qui existe au monde; c'est la race Kechua que nous rencontrerons au Kuzko et ses environs; race complètement ancienne car ses fruits se développent instantanément, mûrissent bientôt. En effet, tous les enfants *Kechuas* ont dans ses traits quelque chose qu'annonce l'ancien-

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neté, et si nous les entendons parler nous seront émerveillés de voir que ses pensées sont d'un homme et non pas d'un enfant de trois ou quatre ans. Ils expriment à merveille ses *pensees* et prononce et connaissent sa langue comme un académicien; c'est le *Kechua* qu'ils en parlent, langue primitive et synthétique, car avec un seul mot ils expriment toute une pensée entière; langue qui a beaucoup de resemblance avec l'hébreu.

Je serai heureux si tout ce que je viens de dire fût confirmé par la science et par l'étude comparative des monuments et d'objets anciens des temps préhistoriques du Pèrou, Mexique, l'Inde et l'Egypte, sans oublier le Japon et la Chine; car les objets et les constructions anciennes de ces deux nations ont ses points de resemblance aux constructions primitives américaines—sont des points de passage, pour ainsi dire, qui marquent la marche de la civilization d'Amérique en Asie.

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CAVE-DWELLERS OF THE SIERRA MADRE.

BY CARL LUMHOLTZ.

IN speaking of the cave-dwellers of the Sierra Madre, whence I have just returned, I shall first have to say that the late Lieutenant Schwatka's writings about these people were a gross piece of humbug. *De mortuis nil nisi bonum.* But as I, on account of a prolonged stay of secluded life in the Mexican mountains, only recently came across a magazine article of his published last year, and as I fear that some scientists may have been led to believe in his so-called discoveries, I am in the name of truth bound to state:

1. His journey of discovery was to go by stage from Chihuahua to Carichic; from there he took mules and went on the beaten track to Urique—five days' ordinary journey,—whence he returned by another beaten track through the well-known mining town Batopilas. I have ample proofs to show that he never left this beaten track, the *camino real*, to examine a cave.

2. What he relates about "living cliff-dwellers," as he calls them, is what he has heard from others, supplemented by his own imagination.

3. He also brought back "cliff-dwellers" to Chicago. With the exception of a woman and child, who were pagans, and possibly may have been living in a cave, the "cliff-dwellers" were from a village, Yoquibo. To speak of these as cliff or cave-dwellers is ridiculous in the extreme to any one who knows the facts.

I hardly think I need waste time by going farther into the subject of this kind of "cliff-dwellers." I shall now show that there are cave-dwellers in the Sierra Madre, but they are very different from those that the vivid imagination of the late Lieutenant Schwatka evolved.

While the northern part of the Chihuahua Sierra Madre has a considerable number of sometimes very fine ancient cliff and cave dwellings, besides a few other antiquities (square stone houses, fortresses, etc., on top of the mountains) the southern half of the Sierra is almost destitute of antiquities. Only rarely one meets with old

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cave houses. I have mostly found them on the headwaters of the Rio Fuerte, and the Tarahumaris tell me that they were built by the Tubares, a now nearly extinct tribe, which used to be constantly at war with the Tarahumaris. These houses are very simple, the caves being merely walled in, and the houses are one or two stories, according to the height of the cave. Other kinds of ruins one does not meet with except in the adjoining ranges and valleys of the *tierra caliente*. This southern part of the Chihuahua Sierra Madre is inhabited by the numerous Tarahumari tribe, while towards the south the Tepehuanes, of whom some two thousand live in Chihuahua, adjoin them; the Tubares are their neighbors towards the west, and the Pimas towards the northwest.

First a few words about the physical geography of the country inhabited by these tribes. Sierra Madre is in Northern Mexico, a broad, high plateau, some 7,000 to 8,000 feet above the level of the sea, falling abruptly down towards the west, while towards the east it gradually sinks down in the extensive lowlands of Eastern Chihuahua. A few summits rise to 10,000 feet, while one of them, Cerro de Muinora, near the State of Durango, I found to be 10,450 feet, thus without doubt the highest in Chihuahua. There are a few llanos, but they are small. The general character of the landscape is one of small hills and valleys, sparingly watered and covered with forests of pine and oak. Very characteristic of the landscape here are, however, the so-called "barrancas," which, like huge cracks, 3,000 to 5,000 feet deep cañons, traverse the high plateau, generally from east to west. Nearly the whole country of the Tarahumari is drained by the Rio Fuerte, which, with its numerous tributaries and side branches, forms as many barrancas. While the temperature of the highland is moderate, with even snow in the winter, it becomes down in the barrancas one of excessive heat, only pleasant in the winter time. The climate is also very dry, but as corn will grow with a moderate amount of rain, it generally does well both on the highland and in the barrancas, where also beans and tobacco thrive. Turkeys, deer, lions, bears, squirrels and rats are common, while in the cañons the *felis onza* and the pecary are found. Still, animal life is not rich. Edible fruits and roots and a variety of palatable herbs (at least to me), for instance the common watercress, species of mentha (*l-pa-saa-te*), chenopodium, cirsium, etc., are quite numerous, especially in the barrancas. The general impression of the landscape is one of rocks and pines, with nothing of romance about it; while the stupendous chasms,

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the barrancas, with their odd vegetation of *opuntiæ*, *agave*, *dasylirium*, and down below the wondrous columns of *cereus pithaya* are grand beyond conception, seen from above the crest, their yawning abysses winding along as far as the eye can reach. Weathered porphyry and interstratified sandstone is the most common rock, and innumerable caves and shelters are found everywhere.

This country, where the natives count only three seasons, the dry, the rainy, and the winter, is occupied almost entirely by the Tarahumari Indians, who, generally speaking, live between 25½ and 29 degrees north latitude, *i. e.*, from the pueblo of Temosachic south towards the border of Durango.

These people are the present-day cave-dwellers of the American continent. Some of them are permanent cave-dwellers, for there are barrancas and arroyos where cave-dwellers always may be found, but most of them are only temporarily so. The Tarahumaris may change abode several times a year, because they plant corn in different places, and remove their domesticated animals (cattle, sheep and goats) according to the season, and for other reasons known only to themselves. The so-called Christian Tarahumari lives in winter in the village, or pueblo, while he spends the rest of the year at his ranch, generally living in humble wooden shelters, and sometimes in caves. Many at present do not come to the villages at all, as the missionaries taught them to do, but go into caves in the winter, *se encuevan*, the Mexicans say. Thus in the neighborhood of Nararachic many Christians are cave-dwellers during the winter, but in the summer most of them leave the caves for fear of the scorpions, tarantulas and "vinagrones" (*Telyphonus*), which in the warm weather frequent the rocks. Many caves have also within the memory of man been left for good, owing to Mexican occupation of the lands and the Tarahumaris' dislike of being near the whites.

As regards the pagans ("gentiles"), who still in considerable numbers are found in the remote barrancas so difficult of access, they all love caves, but their mode of life is shifting. They plant corn high up on the crests of the barrancas in March, and again, when the rains commence in June and July, they descend into these canons to plant corn here. Subsequently they harvest, first upon the high ridges, then in the barrancas, where they retire for the winter to enjoy the warm temperature, living, generally speaking, on the ridges in a kind of wooden house or shelter, and down in the barrancas in caves, or under a big stone, or under a tree, as the case may be. The greatest num-

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ber of inhabited caves are found in the western part of the Sierra towards Sinaloa. It is very seldom indeed that the caves are improved. I have in a few cases seen partitions of stone and adobe, but they never reach to the top of the cave. The most common improvement is a stone wall in front of the cave, reaching to a man's breast. Almost invariably queer little square store-houses or closets of stone and adobe are met with inside the cave, and also rouud ones in many remote and inaccessible places outside. The caves are rarely found in inaccessible places, like some in the United States; if they are difficult of access, they are made accessible by one or two wooden ladders, or, rather, notched trunks of trees.

It is hard on flesh and blood to climb up and down these barrancas, working one's way slowly among precipices or in the river running at the bottom, and besides having very little to eat, but all one's troubles are amply repaid by meeting the primitive inhabitants of these canons. They cultivate their small fields of corn, beans and tobacco on terraces, exactly of the same kind I have so often seen farther north, abandoned ages and ages ago (*trinjeras*, the Mexicans call them—riffles). They, like their Christian brethren, are in the possession of domesticated animals, and all that usually accompanies these, also iron implements, but in any other respect they seem to be in the same stage of culture as they were at the time of the conquest. Spanish is not spoken among them. The women wear a skirt, and the men a breech-cloth around the loins, but they are otherwise naked, covering themselves with tunics, however, in chilly weather. The caves are always found apart, often a mile or more distant, but sometimes only 100 or 200 yards. I have heard of one arroyo where six can be seen at the same time, some thirty or fifty yards between each, but this is a rare case. It is also rare that more than one family lives in the same cave; in that case near relatives. A peculiar custom it is that the Tarahumari father and mother at night leave the house or cave to be taken care of by the children, while they go to sleep under a tree, in the shelter of the store house, or in a cave, according to convenience.

Not only the Tarahumaris, but also the Pimas, to the northwest, and the Tepehuanes, to the south, as well as the allied Huarogios, in their limited area to the west, are more or less cave-dwellers, although the majority even of the Tarahumaris live in wooden or stone hovels.

I have spent one and a half years among these people, and have taken down fairly complete vocabularies of the Tarahumari, Tepehu-

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ane and Tubar languages, having had valuable assistance from my temporary companion, Mr. C. V. Hartman. The best part of the last year I have lived among the Tarahumaris, who are the most primitive of them all. I have generally been accompanied by one or two Mexicans, the rest of my party being made up of Indians who carried my things, but I also at times have had only Indian companions. I have been fortunate enough to bring back very rich anthropological material as well as the implements and utensils these people are possessed of, and I shall now take the liberty of making a few remarks on the Tarahumaris, such as the time allotted to me permits.

Tarabumari (*Ta-ra*, count; *bu-ma-ri*, run) means people who run according to count. The name originates from the custom, at the foot-races, to keep an account of the circuits by laying down on the ground as many stones in a row as there are to be circuits, and taking away one stone for each circuit that has been made. They are of medium height and dark brown; hair black and straight. Rare instances of wavy hair may be noticed. The people of the barrancas are smaller than those of the highlands, but they are all muscular and singularly able to endure exertion and fatigue. There are probably no greater foot-runners than these people; they outrun any horse, not by speed, but perseverance. Good runners have at the foot-races been known to make over forty miles in six to eight hours, endurance more than speed being the point of the play. They will pursue deer in snow for two or three days until the hoofs drop off the animal, and it thus becomes an easy prey. Although their arms are not strong, I have had, out of a number of twelve, five lift 102 kilos, while three lifted 130 kilos. Having got the burden on their backs, these same three carried 102 kilos on level ground 500 feet, without much trouble, although they were all pretty well starved at the time the experiments were made.

Their senses are keen, but not very much superior to the senses of those among us who are well endowed in this regard. They certainly do not feel pain in the same degree as we do. I have taken hair samples from heads of more than fifty, but not one of them minded in the slightest degree having thirty or forty hairs pulled out at the same time. Once six hairs were simultaneously pulled out from a sleeping four-year old child, without causing the least disturbance. I asked for more, and twenty-three hairs pulled out made the child scratch itself a little at the place, but it continued sleeping.

They beckon with their mouth, protruding it and raising the head in the desired direction.

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Their only weapon is the bow and arrow, the shaft being made generally from reed, sometimes from a kind of salix. The points are long and of hard wood, and the arrow-release is primary.

They show considerable artistic sense in the ever varying pretty patterns of their blankets (the looms are worked on the ground) and girdles. Their basket-work is very simple and admits of no comparison with the work of the North American Indians. Their pottery is rude, and the best the Tarahumari can produce is red-colored, but in no other way does he understand how to decorate it, differing in this respect entirely from the ancient cliff-dwellers, who have left us some very pretty pottery. He shows only the rudiments of the architectural skill of the ancient cliff-dwellers, and he does not tame the turkey or the eagle, or other birds or animals.

One certainly must admire the dexterity, and even ingenuity, these people show in trapping animals. Even horses have been known to be caught and hoisted up in the snares laid for the foot of the deer, and thus killed. Every day he either sets his traps for deer or smaller animals, or he goes hunting with his bow and arrow or his axe. In order to get at the squirrels he will cut down six or more big pine trees, a whole day's work for a small animal, which he carries home hidden in his blanket, that nobody may see it and help him to eat it. The fish are poisoned wholesale in April and May, different kinds of plants being used for the purpose, especially *Palo de la Flecha.*

The principal food is *pinole* of corn, and meat of squirrels, rats, mice, snakes, etc., etc. The greater part of the corn is used for the making of native beer. The Tarahumari's store of corn is gone by February or March, and thus half the year he lives in plenty, while the other half he keeps up a starving existence, subsisting mainly on the heart of the maguey, baked between hot stones (*Mezcal tatemada*), and also on the fruits of *Cereus Pithaya*, and other fruits, different herbs, fish, etc.

He is quite clever in skinning and stuffing animals and would make an excellent taxidermist, for he goes much into detail and is minute and exact in all his doings. He considers well before he makes a bargain, and in important bargains he consults every member of his family. To strangers he does not sell anything at all. It is a favor he confers upon another to part with any of his belongings, and afterwards the two who made the bargain consider themselves united in a tie of brotherhood, calling each other *Na-ra-gua*, and confidence is established between the two, almost as much as if they were *compadres.*

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Extremely distrustful of strangers, those who live outside of the beaten tracks will invariably take to their heels, leaving everything behind them at the approach of the stranger. They are timid if few in number, but are able to show much bravery when there are several together. However, they are a very peaceful people, and will not do any harm, except when they think themselves injured. In a few hours some hundred or more will unite to kill the offender with arrows. There are two or three barrancas where the Tarahumaris prevent whites from entering, because they are afraid of mines being discovered in their territory, which they have learnt means death to them.

Very hospitable they are not. In their house or cave is no room for the stranger. If you want to get on with the Tarahumari you must, on arrival, not enter the house, but sit down patiently at thirty to fifty yards' distance, waiting till it may please the *paterfamilias* to step out and see you. This takes at least fifteen minutes. If he does not know the person, or for other reasons, the visitor may have to wait two hours. Only the dogs enter the houses at once, say these Indians. A Tarahumari visiting another, be it his best friend, is never, except in the case of exceptionally bad weather, asked to stay for the night in his house. He goes and sleeps under a tree, or a big stone. Food, however, is always given the visitor, if he be an Indian.

These people have a great variety of games and plays, the favorite being foot-racing. The women also race, but do not toss the ball with their feet like the men; they throw it with wooden forks as they run along. Another mode is to throw rings with sticks as they run. "Quinze" and "cuatro" and dice of knucklebone are commonly met with. The play "Lechugia" should be mentioned, and there are also the contests in arrow-shooting between two men, and the *Tchwa-ri*, women playing with a ball to be beaten to a certain goal.

Although in all bargains a Tarahumari is just and reliable, he will steal if he thinks himself quite safe and unobserved. Between themselves this is not often the case, but quite recently an instance came to my notice of two Tarahumaris, who had been stealing in a certain barranca, being summarily dealt with. They were hanged, and arrows shot through their bodies.

They are very critical one with the other, and a great deal of gossip goes on. Hence probably the reason that they are so bashful. They are not specially lovers of truth, and are false and revengeful. The women are chaste and object to unions with the Mexicans. Only

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at their feasts, when they regularly become intoxicated, they, as well as the men, seem to lose all shame.

Of marriage ceremonies there are few. The woman seeks the man, and when all has been agreed upon between the parents of the young couple, they all take a seat on the floor; the young couple are covered with a blanket, and admonitions given to both of them. Then the father of the boy gives his daughter-in-law a gourd of native beer, and the father of the girl gives his son-in-law the same; whereupon they all drink and get very drunk.

The medicine-men (*o-wi-ru-ami*—the virtuous) are also the priests. Their function does not appear to be very different from that of other Northern Indians. But it may interest to hear the names of the diseases of the human body known to these scientists. All sicknesses have their origin either from the wind or witchcraft. If of the first kind, nobody dies from it. Names of these: *Su-ra-gaa-ga-ri*, when the wind settles in the heart. *Ae-ma-gaa-go-ri*, wind where the liver is. *Mau-au-gaa-go-ri*, wind in the head. All other diseases are brought about by the wizards, who may put different kinds of animals, like toads, snakes, centipedes, scorpions, etc., in the unfortunate people's bodies, which can only be cured by having the animal drawn out.* There are a few truly excellent remedies of the Sierra used by these doctors, who for instance, with the *herba de vivora*, pretend to cure even rattlesnake bites, but they generally have recourse to supernatural means, and there are specialists for the different tricks to be performed on the patients. To keep off small-pox they make fences across the tracks leading to the house, which they also surround by spiny branches of different trees, snake skins, etc., not to forget a cross interwoven with different-colored threads, so as to make a square piece, that is hung to a reed. This last contrivance makes a powerful talisman called *Wi-sbi-ma*. Similar ones are found on the mummies of Peru. The wizards can make sick or kill by their mere thoughts, but they also use different objects to obtain their ends: lizards, still better the fore-leg of a toad (because it is a good animal, being an active rainmaker, and is never killed by others than the sorcerers), but principally the humming-bird. It is stripped of all its feathers, and dried, and then enveloped in the cotton of Pochote. To the Tarahumari the humming-bird represents God, and is much mentioned in his songs.

* Really serious diseases seldom call the doctor's skill into play, for the Tarahumaris are an extremely healthy tribe.

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The sorcerers use the things that are high in their estimation to do evil with.

The pivot around which the thoughts of these Indians move is rain and native beer. In their dry country rain is of the utmost importance for their crops, and without crops they do not get their *su-wee-ki* (beer, made from maize). The Indian is inordinately fond of this, besides needing it for his ceremonies. No act of importance can be done without it. *Su-wee-ki* is given with the mother-milk to the infant to "cure it." The dead do not get rest without this beer being set apart for them, and it is the great remedy in the medicine-man's hands. But never do they think of using it without first having sacrificed a part to their god, who also wants this drink as much as they do. The Mexicans call it *Teswaino*.

In order to make rain, they are in the dry season kept extremely busy dancing to the sun and moon. The sun is called *au-nau-ru-a-mi*, high father; the moon *je-ru-a-mi*, high mother. They pray to them in their houses, but generally many join at a certain place to do their worship and prayers by dancing in front of a cross. One or two men use the rattle and sing, while men and women dance. There are different dances in the different seasons, but the principal ones are *Yu-ma-ri*, a circular dance, and *Ru-tu-bu-ri*, a kind of march forward and backward in a line. In the winter *Yo-be* is used for making snow, which is necessary for a good year. They always sacrifice sheep or goats, or even oxen; formerly it was deer and fish and squirrels, and still is so in many places. First of all, the beer is sacrificed at the commencement of the ceremonies, the singer throwing up in the air one gourdful to the east, then others to the west, south and north. The same is done to the meat as soon as it is boiled; all the bones have been taken out and no salt put with it. The dance goes on all through the night, and with much earnestness, that the effect of their work may not be spoilt. The pagans generally let one man only dance, to make sure that nothing—for instance, laughter or natural noises—shall interfere with a successful result. The dancing is called *Nau-tsha-li o-la-wo-a;* this means literally: they are going to work. By dancing they also keep away diseases, besides caterpillars and grasshoppers that eat the corn. For the dead they have three dancing-feasts in one year, the first the smallest, the last the biggest. For a deceased woman they have four, which is also the case if the deceased is a man who has been accustomed to drink *Hi-ko-ri*. I cannot here enter into details. As thanks for the crops they give several of these dancing-

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feasts, the first being the most important. Several basketfuls of ears of corn and twelve fresh stalks are offered to the god, while only a small portion of it is sacrificed, together with all sorts of food. There is not a family that dare eat any part of the corn without having first sacrificed.

The Tarahumaris do all kinds of work in common, ploughing, sowing, cleaning the cornfields from weeds, harvesting, etc. The *paterfamilias* and his household dance morning and evening, sacrificing food and beer, and asking the sun for whatever they may want, generally rain. On the third day come the neighbors, perhaps ten to twenty, who get through with their work by noon. After that they drink and get very drunk, for, formal and nice as everything is through the business part of the ceremonies, the debaucheries immediately afterwards are repulsive. Fighting and killing is not uncommon at these feasts. A Tarahumari never kills another, except when drunk, for the blood is God's, he says.

For the benefit of the moon, who is very efficient in making rain, are made four or five feasts a year. Also three cigarettes are in this case offered under the cross. The medicine-man takes one of them, gives one puff, raising simultaneously the cigarette upwards towards the moon, and saying, *Su-ar* (Rise) *a-mi* (yonder) *re-pa* (upwards)! This is three times repeated. The master of the house and wife do the same, and now all may smoke. The ceremony is in order to cause the smoke to form clouds with the help of the moon. But the Tarahumari rarely smokes tobacco, except at his feasts. He would offend the sun by so doing. Therefore in most cases he smokes only after sunset, or when drunk at the feast.

For the sun they each year make a feast of three days on two occasions. Both the sun and the moon are "cured" at the feast by a mixture of different remedies, which the medicine-man tastes first and then throws to the four cardinal points, upward to their father and mother, whom they besides alternately reproach and implore to gain their ends.

Their dances are imitations of animals, and their songs implore the animals to help. The birds, who sing in the spring, sing for rain; the crickets, the turtles, the fish, the frogs, all help to make rain, and all dance. The deer in the pairing season taught them to dance their great dance *Yu-ma-ri*, and the wild turkey taught them their other great dance *Ru-tu-bu-ri*. The chapparal-cock is a very bad bird. If he passes near by a house, somebody is sure to die. Still, as this bird is

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the cause of hailstorms, which may be of use before the corn gets big enough to be hurt by them, the help of this evil bird is also implored at a short time of the year, in April and May, and he has his song and his dance. Also the owl, a bird of even worse omen, has for the same purpose his song and dance, but the women are afraid to take part in this. At a feast they may select the songs and dances that answer to the necessities of the season. In *Yu-ma-ri* and *Ru-tu-bu-ri* they simply mention all the animals by name with a few characteristics of each one. By their incantations to the animals they also desire to make them multiply, that there may be more for the Indian to eat.

In the winter, when they have plenty to eat, they forget their God, but when hard and anxious times come in March and following months, then there is much dancing and sacrificing. Their God comes down and tells them that he wants sheep and beer. Every man will have to kill so many, perhaps two or three, and make beer. And the message immediately goes all over the Sierra, and they all comply with it. A few days later comes another message from God, who has come down at another place, that all the maize will dry up if they don't quickly kill a cow and three white hens, etc. And so it goes on all through the summer, and no rain, and more messages of more sacrifices being required. The Indian argues with his god that he must not be so greedy, but his mouth is shut with the question: What would you say if I asked for a Tarahumari to be killed for me? At last, however, the Indian loses patience. "We are tired of this now, and won't give any more animals," the chief in Nararachic told me the other day during the continued drought of this year.

The newly-born babe is left naked, exposed to the sun, that he may know his new son. Three days old, the babe is "cured" by the medicine-man, who holds it in his arms over the smoke of the mountain cypress, and moves it toward the four cardinal points. With a fire-brand he makes three crosses on the forehead, if a boy, or four, if a girl.

I must at last mention the worship of plants. There are five kinds of plants, apparently species of *mamillaria*, which are worshipped by the Tarahumari. They have different qualities, the most pronounced of them being to drive off wizards, diseases, robbers and Apaches. One brings long life, which all the Tarahumaris want; another makes the eyes large so as to see the sorcerers. The most noted and the one most in use is *Hi-ko-ri Wa-na-me* (superior Hikori), which is besides used to make an intoxicating drink, and as a remedy for fever

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and snake-bites; it also heals wounds. The Mexicans call it Peyote. This Hikori and the other Hikori are found growing in the ranges to the east of the Mexican Central Railway, and the Tarahumaris have to make the long journey to get them. They have to be on the spot before daylight, to be present when the Hikoris rise, for, according to the Indians, they are covered up at night. These plants are individuals who sing and talk, and *Hi-ko-ri Wa-na-me*, the intoxicating one, is always very drunk. The Indians are careful not to hurt the plants, and each kind is carried home separately, or they would fight. On their return the Hi-ko-ris are met with great honors and a whole night's feast and dancing; a sheep is sacrificed to them, and they also need beer, which is sprinkled over them. Four of these plants are small, but there is a fifth, a larger one, called *Wa-lu-la Sæ-li-a-mi* (meaning the great authority), which wants an ox (he will eat the Indian if he does not get it), and which, therefore, scarcely any one can afford to bring. This plant never dies. The sun and the moon are also benefited by Hikoris through the medicine-men, and all diseases are cured by them. All the Hikoris are very virtuous, and they have to be kept in separate rooms by themselves, where they can see nothing bad. Elaborate ceremonies are in use at the feasts where Hikori is drunk by the people to keep them in good health. The medicine-man on the occasion sings and makes much noise with his notched stick, which typifies the strength of Hikori. The women and men of the medicine-man's crew dance, but alone and one at a time. Total abstinence from sexual intercourse for three days before and three days after is required of the medicine-man; one day of the other participants. The name of the women who take part is *Ra-ko-ro* (stamina) and of the medicine man *Tsjaa-ja* (pistil). Each Hi-ko-ri is worth a goat, and if sold the buyer has to give it a reception similar to the one given it when first it arrived from its country; and every year in the same month of the arrival a feast must be given to it. After four years the plant is useless and is buried in the corner of the house or cave, or even taken back to its country.

The names of the Tarahumaris are taken from animals, birds, reptiles, fish and insects. Other names are: *La-chu-mu-le* (Blood of the squirrel), *Chu-ru-wi-si* (Hunger), *Si-ta-wa-cha-li* (Breech-cloth), *Te-bo-chi* (Stone wall), *Va-la-gae-chu-li* (orphan), *Si-kau-le-a-mi* (Gummy eye—Sp., *laganoso*), *Chu-mi-wa-ki* Snotty—Sp., *moscoso*), and for women, *Cho-na-ca-li* (Darkness), *Ku-rou-su-li* (Toasted ear of corn), etc.

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The dead are buried in caves, and remain for one year wandering on earth in the shape of animals. The sorcerers and people who cannot pay the medicine-men always remain so.

The Tarahumari is intelligent, and when he learns to read and write, which is extremely rare, his ambition runs very high, to become General, Governor of the State, or President of the Republic. I do not think their number exceeds 30,000, of which 3,500 or 4,000 are pagans.

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ORIENTATION.

BY A. L. LEWIS, F.C.A.

THE orientation or position of buildings in regard to the points of the compass is a subject which has received much attention of late; and when it is remembered that the *sides* of the ancient Egyptian pyramids and sacred buildings were almost always placed toward the cardinal points, while in Chaldea the *angles* of the most ancient sacred buildings were as universally placed toward those points, it will become evident that there is a possibility of some information being gained as to the origin of other civilizations and the routes by which they have been conveyed by a study of the orientation of buildings and other remains in different places.

The object here, however, is not so much to draw conclusions, or even to state facts, as to relate briefly what investigations have been made into the question.

Perhaps the most important papers recently published have been those contributed to *Nature* by Prof. Norman Lockyer, F.R.S., who has endeavored to show that some of the temples of Egypt were set to face the sunrise at certain periods of the year, and were, in fact, observatories by means of which the priests were able to make calculations useful for material as well as for religious purposes; and that, as the point of sunrise altered in the course of cen turies, new temples were built on or adjoining the older sites, but in a diff erent line, suitable to the altered position of the sunrise; and he hopes that the dates of many of these buildings, and of the kings in whose reigns they were built, may ultimately be fixed by astronomical data obtained from their position. In addition to this, Prof. Norman Lockyer has found that many of the Egyptian temples were apparently set toward some star in the neighborhood of the pole, and he hopes to fix dates for these buildings also by astronomical calculations. In his last communication,* Prof. Norman Lockyer suggests that those Egyptian cities of which the walls trend northeasterly and southwesterly, and northwesterly and southeasterly, as at On and Thebes, were

Nature, May 18, 1893.

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the seat of an early solstitial sun-worship, associated with the rise of the Nile and with the observance of a star rising in the north, and that these were superseded for a time by an equinoctial form of sun-worship, accompanied by the worship of a star rising in the east, brought in by invaders, probably from Chaldea, who built Memphis and other cities, the walls of which faced the cardinal points, and who also built the pyramids; and he attributes many of the wars and revolutions of ancient Egypt to the struggle for supremacy and alternate success and defeat of the different races which practiced these various forms of sun-worship. Prof. Norman Lockyer has probably much to do before his views are fully accepted by Egyptologists, but he has at least made it clear that anthropologists cannot safely neglect the study of orientation.

In Syria and Greece many of the temples have their angles rather than their sides toward the cardinal points. This may be because their builders worked under a Chaldean rather than under an Egyptian influence, or it may be because both in Greece and Chaldea the sun at the summer solstice rises further to the north of east than in Egypt, and that the axes of the buildings have been set to the rising point of the sun at midsummer. Prof. Norman Lockyer considers that it was because the floods of the Tigris and Euphrates, necessary, like those of the Nile, for agricultural purposes, took place at a different time of year from those of the latter river.

Mr. F. C. Penrose has been investigating the bearings of Greek temples, and has communicated the results of his investigation to the Royal Society.* He finds that some of the older temples were set toward certain stars, and altered afterwards as the rising point of those stars shifted, and he gives a list of twenty-seven temples which appear to have been arranged for a solstitial solar bearing, as against seven not so arranged, in some of which latter, moreover, the absence of such arrangement is capable of explanation.

The orientation of mediæval churches has long been a subject of discussion and inquiry amongst architects and archæologists. In France and Britain the axis of old churches is almost invariably, roughly speaking, east and west, but in Italy there is no such rule, and the churches stand in all positions, so that this form of orientation is not of Roman, but of British or Gallic origin. While, however, the churches of Britain and France stand, roughly speaking, east and

* See abstract of his paper in *Nature*, May 11, 1893.

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west, there are many variations, mostly in a northeasterly direction, the origin and purpose of which have been the cause of the discussions I have referred to. It has been suggested that the chancel was so placed that the sun should shine in at the east window on rising on the day dedicated to the patron saint of the church, but this theory does not seem to fit all the facts, even after allowing for the difficulty of ascertaining to whom the first church built on any site was dedicated. In any case the custom would appear to be associated in some way with sun-worship, if only as transforming it into saint-worship in order to suppress it. It is known that most of the highest hills in the Grecian islands were dedicated firstly to Helios (the sun) and afterwards, as the most easy transition, to St. Elias; and it was in pursuance of this custom of dedicating the highest hills to that prophet that the Russian adherents of the Greek Church called the highest point of Alaska Mount St. Elias.

From the temples of Egypt and Babylonia to British mediæval churches seems a long step, but there may be a connecting link, and I must, in conclusion, briefly notice the ancient structures which may form that link, and with which I personally have chiefly concerned myself during the last thirty years.

The stone circles, which are more numerous and larger in Britain than in any other part of Europe, have apparently been used in some kind of observance of the sun, and perhaps of the stars. In Egypt the plan was to construct a number of chambers communicating with each other by narrowing doorways, so that the ray from the sun or star should at the right time shine through them all into the holy of holies. In Britain the plan appears usually to have been to place a stone outside the circle, as at Stonehenge, or to place the circle in such a position with regard to some prominent hill that the sun should appear from the circle to rise over the latter, and I have found several instances in which circles were so placed, sometimes with regard to single summits, and sometimes with regard to groups of three hills, or to a hill presenting the appearance of a triple summit. It is a remarkable coincidence that the Akkadians of Chaldea called the northeast the cardinal point of the mountains, and that it is to the northeast of many of the British circles that the principal hills in the neighborhood and particularly the triple summits are found; and that the Akkadians called the southeast the funeral point, and that most of the sepulchral stone chambers in Britain open toward some point between south and east. If, however, these similarities suggest a community of thought

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between the Chaldeans and the circle-builders of Britain, it must be observed that there are other circles in which the north seems to have been the principal point regarded, and that the measurements in and between some of these are multiples of an Egyptian or royal Persian cubit of 25.1 inches. Details respecting all these points with some illustrations are given at considerable length in three papers which I send herewith for the library of the Department of Ethnology and Archæology of the Columbian Exposition. A series of articles which I am contributing to the New York publication, *Science*, will also contain many details upon this subject.*

In saying that the circles may be a connecting link between the most ancient temples and the mediæval churches, I need hardly point out that while there may have been a direct connection between the circle-builders and the church-builders, none has yet been shown between the circle-builders and the architects of Egypt, Babylonia or Greece. It is in the discovery of this association that the anthropologist has still much work to do, in which a study of the questions connected with orientation may possibly be found of assistance to him.

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*No. 1, Abury, published March 24, 1893.
No. 2, Stonehenge, published May 19, 1893.
No. 3, Derbyshire Circles, published July 14, 1893.

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THE TUMULI OF HAMPSHIRE AS A CENTRAL GROUP OF THE TUMULI OF BRITAIN.

BY JOHN S. D. PHENÉ, LL.D., F.S.A.

[Abstract.]

THE author stated that to speak of the tumuli of Hampshire of to-day is simply to speak of the tumuli which still exist in an area around the great historical and, as correctly, the great prehistorical, city of Winchester. But prehistoric archæology is not fettered by the boundaries of this or that county, and in order to comprehend the subject, "The Tumuli of Hampshire," it is necessary that the tumuli of the period, perhaps periods, of their creation, unlimited by boundaries of shires or counties, be taken into account.

There was clearly design in the placing and arranging of the tumuli, which spoke to the wayfarer in no uncertain language of distance, of danger, and of rest. In the Isle of Wight is found repeatedly a solitary tumulus just before coming to an abrupt valley; so abrupt as to constitute it a precipice, or at least a descent where a wayfarer might, in a fog or mist, soon get lost; and this, in more instances than one, guarding the way on both sides of the danger. In like manner, in the Isle of Wight, Dorsetshire, Berkshire, Oxfordshire, and the ancient routes leading to and from such localities, are certain terraced works surrounding the areas occupied by special tumuli, which seem to imply protection of sacred precincts. On the Downs such terraced works are almost always placed from the northeast to the northwest sides of the hills, and they may have been for warlike defense, as well as for securing sanctity. The most carefully-guarded of these hills are surmounted by tumuli arranged in studied and symmetrical forms, and these forms correspond to similarly-arranged designs found alike in America, Greece, Ireland, Spain, France, and other countries.

At New Grange, Ireland, and in the Isle of Wight, are serpent-mounds similar in design, or intent, to that of Adams County, Ohio. In the Isle of Wight the position of the serpent's head is indicated by *three mounds*, two of them representing the extended jaws, with the third mound between them, just in the attitude which, were the object a solid and continuous serpent, the jaws and the object about to be de-

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voured would take. With few exceptions, the form of the solid and continuous serpent was that which pursued the sun's course, and which, therefore, may be described as the *Serpent of Life;* and the serpent formed by mounds, which were invariably *sepulchral*, was generally from north to south, and it is, therefore, the serpent of the dead, or the *Serpent of Death.* Interments in the solid and continuous serpent occur only in two parts, each of which was evidently a place of great veneration: the head of the serpent probably including the circular form between or near the extended jaws, on which has almost invariably been found an altar of worship, and the highest central curvature of the body perhaps the supposed position of the heart, in which, though not so invariably, have been found objects held sacred by the depositors.

The author then referred to the investigations of Mr. Clutterbuck and others, showing that the great ancient roads of Britain, formerly generally looked on as Roman roads, pure and simple, were really pre-Roman British roads, though adopted, and altered into military highways, by the Romans. The traffic of ancient Britain was mainly in metals, and the metals of Cornwall and the west, including Ireland, passed along the great road leading from the west to what are now the Eastern Counties. The line of tumuli along this route marked the line of traffic; sundry bifurcations occurred. The trade to the Isle of Wight was intermediate, and the track is marked by tumuli, which occur only in a narrow line, and are graves of the traders. There is the great stone of exchange, which accords with that in Brittany. The tumuli stop abruptly at this point, and, after clustering in symbolical forms on the heights to the west, leave no sign beyond the great stone of traffic and exchange, at Mottistone, the name of which shows that the traffic still continued in the time of the Saxons. The great stronghold of Hengist Hill, at Hengistbury Head, near Christchurch, in a direct line with the Needles (Isle of Wight), protected a connection that must have existed long after that between Swanage and the Needles had ceased; and the impressive tumuli on St. Catherine's Hill, and on Headon Hill, continued the line of tumuli from the Needles to the Ridgway by the great east and west road. Most of those from Dorsetshire to the Needles, which form a continuous line to Hengistbury, are lost by encroachments of the sea. The two routes joined near Christchurch, and hence the strongly-fortified fort at Hengist Hill, a word which occurs also in Cornwall, meaning the Hill of Horses.

It was remarked, finally, that the vast figures, produced by

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incisions in the chalk hills along the route here referred to, are near groups of tumuli evidently belonging to the same period and people. Near the figure at Wilmington, in Sussex, a large quantity of bronze and flint implements were found; as also at the figure on the Gogmagog Hills. Similar discoveries have been made at Cerne Abbas in Dorsetshire. The White Horse in Berkshire appears to have been the turning-point from the Ridgway southward to the great marts at Stonehenge, which means the "horse-stone," and the south and south-eastern ports.

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NATURAL HISTORY OF FLAKED STONE IMPLEMENTS.

BY W. H. HOLMES.

AS a result of investigations carried on under the auspices of the Bureau of Ethnology I have accumulated a large body of material relating to the origin, manufacture and distribution of primitive forms of stone implements. Series of the articles collected have been placed on exhibition in the Government building, and it seems appropriate that something should be said in this congress relating to them and to their bearing upon the archæologic questions of the day.

I do not, however, desire to deal with these collections specifically, to describe them or review their history, but to present an analysis of the group of phenomena to which they belong. Thorough analysis of the subject matter of investigation is at the basis of its intelligent consideration. Inferences and conclusions based on a given body of data are unsafe if all the available elements of these data have not been properly considered, and they must still be unsatisfactory if through necessity or oversight any of the elements have been omitted. When analysis is complete classification is easy, consideration is simple, and results are safe, even if not final.

The very general incompleteness and obscurity of the available phenomena of archæologic science, especially in the earlier stages, are well known, and students find it necessary to go over and over again the meager and heterogeneous array of material and to redouble the precautions against misinterpretations and hasty conclusions. History is difficult to read correctly even when the peoples and the whole range of their cultural creations are in full view. Historical investigations based on the scattered relics of a vanished people must be entered upon with the greatest caution. We focus all the light of the present and of the past upon the minutest fields of the remote past, striving thus to read more clearly the obscure characters of the record. No apology is necessary, therefore, for assuming to present here a somewhat exhaustive analysis of that particular group of art remains upon which we must mainly depend for our knowledge of primeval days.

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OUTLINE OF STUDY.

In a paper read at Madison, a few days ago, I attempted to give flaked stone art its proper place among the shaping arts, to trace its history from the earliest beginnings up through the stages that mark the progress of culture evolution. It was shown that the flaking of stone was a primal art and that flaked implements are probably the most ancient and elemental existing representatives of human handicraft. If other forms preceded them, they were of destructible materials, and have long since disappeared. The first flake was probably made by casting one stone against another without premeditation or design. From that primal step, once observed and designedly utilized, there has been a gradual progress by infinitesimal advances in technique, through the stages and the ages, ending in the manifold and wonderful works of the present day.

In the study of flaked stone implements the first necessary step is their identification as *implements* as distinguished from the many allied forms, natural and artificial, that have no claims to be called such. The second step is a consideration of their natural history, which embodies two distinct lines of development, one of the individual from its inception in the raw material, through a series of steps of technical progress, to the finished result; the other of the species or group from a primal culture germ through countless generations of implements; with these goes the evolution of form and function. The third step consists in regarding implements as historic records, first, with reference to questions of time; second, with regard to questions of culture, and, third, with respect to the history of peoples. A grouping of these topics and their subdivisions, approximately as treated in these pages, is given in the accompanying synopsis.

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IDENTIFICATION OF IMPLEMENTS.

Separation from analogous forms. The simpler implements of primitive peoples are often natural forms of stone, or natural forms but slightly altered by human agency. These must be distinguished where possible from natural forms never used or intended to be used. Natural processes sometimes act in such ways as to produce effects closely resembling the simpler artificial phenomena. In cases where much depends on a single specimen of simple form likely to be adventitiously duplicated, discrimination becomes a matter of great importance.

Again, flaked implements of any considerable degree of elaboration pass through progressive stages of specialization, and failures, necessarily very frequent in the fracturing of stone, take place at all steps of advancement. These failures resemble the finished object more or less closely as they happen to have been rejected nearer to or farther from the final shaping stage. Still again, these abortive forms are liable to resemble somewhat closely finished tools of less elaborate pattern or inferior specialization, belonging to other times or intended for distinct uses. Most careful discrimination is called for with these possibilities in view.

Still another point must be considered. The operations of shaping certain classes of tools are not continuous, part of the work being done on the site furnishing the raw material, and part on finishing sites at more or less distant points, and considerable time may elapse between the beginning stages and the final stages of the work, transportation and storage intervening. Thus many specimens representing a stage of manufacture midway between the first and last shaping acts find their way into collections. These have generally been called implements. They are really *unfinished implements*, although they *may not have even a remote resemblance* to the implement in its final shape. To classify and use in historic studies any of these pseudo-implements as actual implements is to introduce error and pave the way to a falsification of the record.

Positive criteria for identification. There are numerous means of identification by which the true implement may be separated from the false. Chief among these criteria may be mentioned (1) degree of elaboration, (2) indications of specialization, (3) signs of use, (4) manner of occurrence and (5) association of other articles. If form is highly elaborated, a strong presumption is created that the imple-

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ment is finished, yet this evidence must not, when standing alone, be relied upon implicitly. The same may be said of indications of specialization, which generally imply adaptation to definite use, and hence finish; yet appearances of specialization are in many cases false, as is clearly shown by the study of quarry-shop refuse, where we find most extraordinary recurrent shapes resulting from accident, as, for example, the abortive blade with a high hump on one side, or with a decided bulb near one end. It is not unusual to see in the vicinity of flaking-shops specimens of flakes and rejects that have been flaked upon the brittle edges by passing feet until they present most deceptive appearances of elaboration and even of specialization.

Evidences of use are generally reliable indices of the finished character of the specimen showing them, and where implement-like objects possessing slight indications of elaboration exhibit in repeated instances corresponding marks of application to manual use, the implication is very strong that they are finished implements. Yet appearances of use are sometimes deceptive, as where decay or wear by rolling in water or in roadways has modified the sharp conchoids of original fracture. There are, no doubt, many cases in which specimens rejected by the original flaker, and having pronounced reject characters, are taken up by others and applied to uses like or unlike those contemplated by the original workman. These objects thus become actual implements, but, being sporadic, they do not constitute a class of implements.

The occurrence of similarly shaped stones in numbers on dwelling sites or on other ordinary sites of implement utilization is generally an excellent test of their status; yet if the site is also one producing raw material subject to shaping on the spot, forms often repeated may be only rejects.

Implement-like specimens associated with evidence of work done, as in ancient quarries and mines, or with refuse of shaping operations in which they may have been employed, as on sites where steatite vessels were rudely roughed out, may be safely identified as implements. A stone without artificial shaping or without signs of use, if repeatedly found under the above conditions, may, perhaps with risk, be classed as an implement or article of use. A combination of conditions of shape, surface appearance and occurrence may serve a good purpose in identification.

The importance of full identification of the implement as such should never be lost sight of. It is the first vital point to be consid-

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ere,' by the archæologist who wishes to consider questions of comparative culture. Questions of age and comparative age are settled mainly by other criteria.

Having identified the implement as such, we may proceed to study it, classify it as to material, manufacture, shape and use, and apply it with safety to the solution of the problems of anthropology.

NATURAL HISTORY OF IMPLEMENTS.

Of the individual. The work of art must be studied pretty much as the biologist studies the living creature. Each implement has its individual history—its inception, development, form and functions. The naturalist studies the creature with respect to its physical development, tracing its history back through the stages of growth to the embryonic inception. The archæologist must study the flaked stone with reference to its origin, the morphologic changes that take place under the flaking hammer and the flaker of bone, and the range of its functions when finished. In this way the life-story of the individual is told.

Of the species. There is also a family history with the implement as with the living creature. It has an evolution that begins with the first stone implement shaped by the hand of man and advances through the ages, changing, specializing and differentiating until the various groups of forms, the species, orders and families, are developed. Each species of implement of to-day is connected by an infinite series of progressive genetic links with the inceptive germ of art, and thus is related to all art.

Accompanying the immediate phenomena of development there are varied attendant phenomena, including the evolution of arts, industries and practices related to or forming a part of the history of implements.

MATERIAL OF IMPLEMENTS.

The nature of the materials available to the implement-maker has much to do with the results reached. The form-elaboration of the individual object and the development of the species of implement are conditioned by the shaping qualities of the stone. The processes employed and the development and differentiation of these processes are likewise governed by the characteristics of the materials. Each implement has its origin in a more or less inchoate mass of the raw material. If the stone is massive one group of processes is employed and one set of results is reached; if it is slaty in character other

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processes and other results follow its use, and if it is in the form of water-worn stones or concretionary nodules, still other processes are employed and still other results are attained. The full elaboration of this to ic will not be entered into here.

SHAPING PROCESSES.

The history of implements, both as individuals and as species, must be studied largely through the channels of technique, and especially through the processes employed in manufacture. There are four groups of processes by means of which the forms of implements are developed, namely, fracturing, battering, abrading, and incising. Fracturing appears to be the most elemental of these, and was probably the first to develop into importance as a shaping art. With the other processes I have nothing to do in the present study. The fracturing operations are known as breaking, splitting, flaking, chipping, spalling and knapping, the term flaking being commonly employed to express the act most utilized in the shaping of primitive tools.

The flaking processes are now so well understood in a general way that their employment in art may be studied and discussed without danger of serious error or misinterpretation. There is in detail, however, great variety of procedure, and all these details can never be fully known. Each people develops peculiarities in shaping-devices and each region furnishes varieties of shaped results, but all these phenomena come within well defined general lines, and details are not absolutely essential to a full understanding of the subject. Fracture is accomplished by two classes of processes, distinguished by the manner in which the shaping force is applied; these are known as *percussion* and *pressure*. The percussive method implies (1) the use of a hard and heavy implement with which the stone to be shaped is struck, producing direct fracture in its simplest form, and (2) the use of two tools, a punch-like implement, set upon the stone at the point to be fractured, and a heavy tool with which this implement is struck, producing fracture indirectly. This process has been mentioned by a number of observers, but is apparently not well understood by any one. The pressure process consists in the use of a tool by means of which pressure is applied to the brittle stone in such a way as to fracture it.

Many of the simpler flaked tools of all tribes and times are shaped exclusively by percussion, and in the earliest times flaking by pressure was probably unknown. In its simplest form fracture by

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percussion is accomplished by striking with the hammer a given point chosen through a knowledge of the fracturing qualities of the stone. In this work a convex-surfaced hammer is required. It appears that in somewhat advanced stages of the work the serrated edges of the implement shaped were probably struck across the projecting serrations by a hammer-stone having a wide, flat periphery, a number of minute flakes being removed at one blow. This is suggested by the occurrence of discoid hammers with flat peripheries on shop-sites and is confirmed by experiment with them.

Flaking by pressure is accomplished in a number of ways indicated by observations made among the savage tribes of both continents. Pointed or edged implements of bone are generally used, but I will not enter into details, as the present occasion does not call for a fully amplified study of this branch of the subject.

A word may be said in regard to the relations of the two classes of operations in their practice. Each may be used unaccompanied by the other, the one making large or rude forms, the other shaping forms such as flakes already too delicate for percussive treatment. When both are employed on the same specimen percussive processes take the initiative, breaking up the stone and reducing the pieces, when large, to approximate shape, and to a degree of tenuity and a relation of surfaces such as to make the other methods readily operative. Smaller hammer-stones are used as the forms become more delicate. The pressure processes are the elaborating and finishing processes, taking up the work when the ruder processes are compelled to leave off. The change from percussion to pressure does not necessarily take place at uniform stages of the work. With tough stone the hammer must go farther than with brittle stone, as the pressure tool cannot so soon be made effective.

In the making of some forms of implements the flaking operations are followed by pecking, grinding and polishing. The tool shaped by flaking may have its edge or point finished by grinding, and many of the implements whose shapes are blocked out by flaking are largely or entirely worked over by the other methods. The flaked tools here considered are limited to varieties shaped wholly by the fracturing processes, or but rarely or to a very slight extent subjected to modification by other means.

DEVELOPMENT OF THE INDIVIDUAL.

The simplest possible artificial stone tool is the result of a single blow. Thus a stone is split or flaked, yielding one (the flake) or per-

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haps two (the flake and piece flaked from) edged or pointed tools of possibly high efficiency. The individual history in such cases is exceedingly brief. By multiplying the blows and directing them intelligently, successive degrees of elaboration are reached and the higher forms are produced.

Synoptic statement. To understand the individual morphology of flaked stone implements it is only necessary to examine type examples of the several well-defined groups, and these may be arranged in tabular form for comparative study, as in Diagram I. The flaked implements of the entire world would make a long list, and an attempt to present all varieties in this place would greatly complicate the study. Most of the more important truths can be brought out by considering the flaked products of a limited region, and I have chosen that region with which I am just now particularly familiar, the Chesapeake-Potomac tide-water country. The synoptic chart includes examples from nine leading groups of implements, extending from the most simple to the most complex forms. They are placed as nearly as may be in the order of increasing complexity or elaboration and are as follows: The unnotched ax, a sharpened bowlder; the notched ax, a sharpened bowlder; the pick, a pointed and notched tool used in rough-shaping soapstone; the chisel, used in carving soapstone; the knife, a blade notched or plain; the scraper, a blade with beveled edge; the drill point, a blade with slender shaft; the spear point and the arrow point.

Other flaked articles are found in this region, but they are sporadic or do not occur as well developed groups and need not be considered here. Those selected have the advantage of derivation from a single form of material, the bowlder, the analogies of morphology and the variations of specialization being more easily observed than where varied materials and forms of materials are used.

As the diagrammatic statement expresses clearly the main features of morphology and comparative morphology, the various points need be but briefly sketched. Beginning at the base with the bowlder, the form of material most used in this region, we pass up through the gradually expanding series to the arrow-point, the most highly specialized form. The relations of the finished implements, placed at the right, to the successive steps of their morphology, represented by rejected forms filling up the triangle, and to the bowlders in which they have their origin, are apparent at a glance. It will be seen that the course of procedure in the simplest shapes is repeated more or less closely in the earlier steps of the more elaborate shapes, and that the

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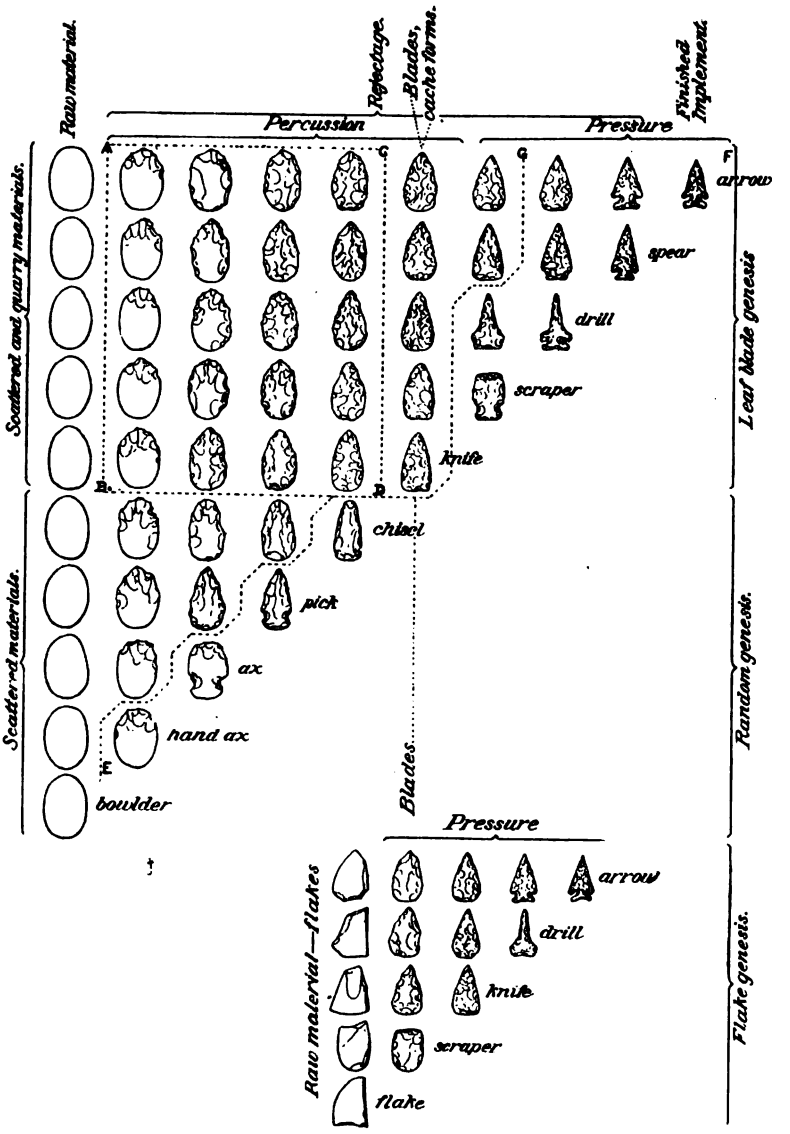

DIAGRAM I.

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divergence of specialization takes place toward the end of the process in each case, usually not covering more than one step (as here formulated) in the simpler forms, and not more than three in the higher forms. Analogies between the rejects, especially in the earlier portions of the various lines, are thus very close. The finished implement in a given case, if not definitely specialized, may not be distinguishable from rejects of corresponding elaboration belonging to the more elaborate implements above. Later on examples will be given illustrating the dangers of imperfect identification and careless placing and use of doubtful forms by students of prehistoric archæology.

I may call attention to two other points brought out by the diagram. First, that the five more highly specialized forms pass through the percussion stage to be further elaborated and finished by the pressure processes, while the four ruder implements are finished by percussive methods alone. Second, that the former are all based on the leaf-shaped blade as a blank form through which they pass at about the point of transition from the percussive to the pressure methods, and that the latter, although approaching that form, never attain it. The former are of both quarry and random origin; the latter are, so far as I have observed, of random origin only, having been made from scattered pieces or masses of material.

It is worthy of especial notice that nearly all varieties of implements produced and used in great numbers by the aborigines are largely of the leaf-blade genesis, and it follows that the production of these blades was a most important function of the worker in stone. The great demand for projectiles, knives, drills and scrapers, led to the systematic quarrying of flakable stone and gave character to the work done in these quarries and the roughing-out shops with which they are always associated. A study of these quarries and shops has afforded a key to the history of the blade and thus to the first step in the morphology of all tools of leaf-blade genesis.

The blades from which these five classes of implements are made are largely of quarry-shop production, and that part of the diagram indicated by *A*, *B*, *C*, *D*, is made up entirely of rejected forms, and these, together with the successful blades placed next at the right, represent and define the ordinary range of quarry-shop work. Operations of like character were carried on, however, wherever the raw material, whether in quantities or in scattered pieces, was obtained and worked. The elaboration of the blade into the various specialized forms is illus-

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trated by the rejects included in the space between the blades and the finished implements at the end of the lines.

It may be noted that all implements of leaf-blade genesis,—the arrow-point, spear-point, drill, scraper, knife, etc.,—do not necessarily pass through the full range of operations here indicated. Many of the smaller specimens are elaborated from flakes and splinters so approximate in shape that they do not require elaboration by percussion, or so delicate that percussion could not be employed. Flaking by pressure is alone required, and an auxiliary diagram is added to Diagram I. that these forms may be properly placed in the scheme of morphology.

It may be further noted here that all implements of a given class are not necessarily of one genesis or of like form and appearance. Simple unmodified flakes with sharp edges are utilized as knives forming a class distinct from the ordinary leaf-blade knife. Heavy flakes unmodified are used as scrapers or are rounded and beveled at one end for scraping, giving a type of tool distinct from that shaped from the leaf-like blade.

Of leaf-blade genesis other regions furnish groups of implements not found in the Chesapeake region. In the middle Mississippi province there is a large and important group of agricultural implements, blades either unmodified or variously specialized to facilitate hafting. There are also in this district some not very well-defined groups of fanciful flaked forms and a group of animal shapes that have their development, as a rule, through the leaf-blade blank. The shaping of fanciful forms was often suggested and encouraged on shop-sites by the occurrence of accidental flaked forms of peculiar shape.

Morphology of the spear-point. The complete plan of development of leaf-blade groups of implements with attendant phenomena may be illustrated to advantage by a single example taken from the more fully elaborated forms, as, for example, the spear-point. This is a highly specialized implement of highly differentiated use. In Diagram II. I present two examples illustrating its development from two distinct forms of stone, one the irregular, inchoate mass broken from the body of rock in place, the other of the rounded form common to the bowlder and nodule.

The order of morphologic change is the same in both cases. With a hammer-stone of suitable size the original mass was attacked, blows being delivered according to the judgment and desires of the workman so that portions were successively flaked away; the form

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being gradually reduced to that of a leaf-shaped blade. When the hammer-stone had developed the blade to a certain degree of tenuity its functions were ended. It was not capable of trimming and notching the specimen, and the work was taken up by the more delicate manual processes known as flaking by pressure.

This history is epitomized in the figure, which gives expression to a number of distinct and important groups of facts. The distinction between the use of material derived from the inchoate mass of rock and that having the rounded form of bowlders, pebbles and concretionary nodules is indicated. The general trend and character of the morphology is the same in both cases, and the results, the finished points, are not distinguishable.

Rejects or "not implements" extend from the second to next to the last member of the series, those up to the blade or cache form being the quarry-shop rejects, and those beyond that stage rejects found on sites of specialization. Rejection was more common in the earlier than in the later stages of shaping, as percussion is more liable to produce deformation or undesirable fracture than pressure; still breakage was frequent under the flaking point. The practice of removing a few flakes to test the material resulted in adding much to rejectage in early stages.

The data for a large part of this diagram were obtained from a study of the quarry-shops, where alone the operations of shaping can be studied to advantage, the work there having been confined almost exclusively to roughing out the blank blades. The exact point in the series at which percussion left off and pressure took up the work cannot be determined with exactness; it probably varied with the material, and perhaps with the worker or the occasion. The change occurred at or beyond the close of the quarry work. The quarry work naturally ended and transportation took place when the percussive method had completed the thin blade. The "not transported" forms are those left in the quarry-shops, and the "transported" include the thin blades and all the forms beyond that stage.

Transportation. An interesting episode in the history of implements produced in numbers in localities remote from the sites of utilization is their transportation. As long as implements were mere random products made where scattered material was found their transportation was a matter of little consequence, but when demand grew and manufacture became an industry requiring the opening of great quarries and the working of extensive factories, the carrying industry

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developed to very considerable importance. It was customary, no doubt, before the white man's materials and implements were introduced, for families or groups of families — possibly whole tribes — to make long journeys to the great flint quarries and to spend weeks or months quarrying the stone and shaping the tools. This is illustrated to-day of the Yankton Sioux, who, in large parties, journey two hundred miles each summer to work the red pipestone quarries and to make pipes or prepare the stone for trade.

A study of the great flint quarries has demonstrated the fact that the shaping operations in them and about them consisted almost wholly in roughing out leaf-shaped blades—the blank forms for many varieties of tools. At the end of the working season the stock of blades produced, together with such flakes and masses as were desired, were packed up and carried away, largely, no doubt, on the backs of the women.

Storage; the Cache. Following transportation came storage. The discovery of hoards of flaked stones, mainly of blade-like form, has been a matter of much notoriety for many years. So uniform is the character of these objects that the name "cache blades" or "cache implements" has become attached to them. The true status of the great body of these objects is sufficiently explained by the discovery that the almost exclusive shaped product of the quarries and great shops is a blade of identical character. As a rule, therefore, the cache "implement" is the transported and stored product of the great shops—the blank form intended for further distribution and for final shaping into the various tools of leaf-blade genesis. Although cache forms are mainly blades, hoards of very rude shapes are sometimes found, for transportation in numbers may take place at any stage in the shaping process. Flakes, fragments and masses of stone were at times gathered and transported in numbers and were thus subject to caching; and finished implements comprising one or more varieties may be assembled, representing the property of some thrifty hunter or the stock in trade of an aboriginal speculator. The manner of storage was usually in compact clusters or piles, the pieces being laid up in neat order and covered with earth. In cases a mound of earth was thrown up over them, as in the noted instance near Chillicothe, Ohio, where nearly eight thousand discoid blades were obtained from a single mound.

Specialization. Following transportation and storage came trade and specialization. Dissemination was no doubt by the ordinary

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channels well known to students of the native tribes. Specialization of the blank forms—the blades, flakes and masses—took place probably pretty much as necessity was felt for the implements. Perhaps in cases the workmen, often old and skilled hands, shaped and finished large numbers of those forms most used, ready to be hafted or shafted for immediate use. Preceding the going forth of a war party, for example, much activity would be shown. A party of one hundred men would require perhaps not less than twenty-five hundred or three thousand arrow and spear-points for fair equipment; and a notion of the needs that led to such undertakings as the opening and working of great quarries can be formed when it is remembered that with the great nations a thousand or more warriors had to be equipped and kept on a war footing from year to year and generation to generation.

Specialization takes varied directions, as in producing an edge, a point, a means of hafting, a sawing edge, a beveled edge, a slender shaft, a curved blade, a gouge-shaped edge, etc. In Diagram I. I have drawn a dotted line which indicates approximately where the work of specialization began. The unnotched ax is specialized at the first step; the specialization being the result on the average of half a dozen blows removing as many flakes and leaving an irregular cutting edge. The first step in the shaping of the notched ax in the line above gives precisely the same result; as does also the first step in each case in the remainder of the series. The notched ax is specialized in the second step by breaking two notches in the sides. In the shaping of the pick there are two steps in specialization: first, the flaking of a rude point, and, second, the making of notches or a rude groove to facilitate hafting. The flaking of the chisel is more complete than in the pick and approaches closely that of the knife blade, from which form it differs in having greater thickness. The term *knife* is here applied to the unspecialized blade only, because it is difficult or impossible to separate it, when specialized for hafting, from the other highly elaborated forms. This and other like shortcomings of the diagram will not detract from its value in expressing the general truths of morphology.

The second and third steps in shaping the chisel are repeated in all the series above. The second, third and fourth steps in the knife blade are repeated in like manner in the remainder of the series, and so on. It is seen that the length of the series indicates approximately the degree of elaboration. The arrow-head has a greater variety of shapes, and, therefore, passes through more steps of morphology than the spear-point; the spear-point has the same relation with the next in-

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ferior form, and so on down the scale. The steps of the series could be increased to the full number of flakes removed in each case.

In the supplementary diagram flakes take the place occupied by the blades in the main diagram. They are placed in the percussion column directly under the blades, their entire elaboration being in the pressure column and ranking as specialization, although the first step in each case was probably that of reducing the flake to a leaf-like outline. As to the details of specializing processes and the final forms produced by them nothing need be said in this place.

Function. The function and manner of use of flaked implements, matters of much importance in their history, must be passed over here for lack of space for their consideration.

INCIDENTS OF MORPHOLOGY.

Now, beside the products of shaping operations in their varied forms, finished and unfinished, there are divers accompanying phenomena which may be briefly referred to in this place. These phenomena are to be observed mainly on the shop-sites where the shaping was carried on, the shops themselves, where extensively used, being among the most striking features connected with the work.

Flakage. Fracture by percussion produces fragments, flakes and chips broken from the specimen shaped and cast aside as waste. Pressure, employed in the more delicate manipulations, also gives rise to like results of smaller size, and generally quite minute. The former are found largely on the great shop-sites where the incipient tools were reduced to approximate size and shape, and the latter on sites where trimming and specializing were carried on. By a study of flakage much is learned of the nature of the work done.

Breakage. Breakage of the incipient forms, under the blows of the hammer or the spasmodic application of the pressure tool, takes place at all stages of manufacture, and the pieces, broken at divers angles and shattered in numberless ways, constitute a large portion of the refuse of the shops and, rightly studied, afford an excellent key to the nature of the shaping operations, the progress of morphology and the nature of the final product. Where operations were extensive every form made is represented by the pieces which may be picked up and joined again. One variety of fragment is liable to deceive the unwary. When an incipient implement has been flaked all around it sometimes splits in such a way that one or both of the pieces appear to have been themselves the subject of the shaping operations.

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Rejectage. The reject proper is a failure resulting not from pronounced breakage, but from abortive shaping operations, which result in the development of some fatal eccentricity of contour. It is typified most fully by the turtleback, a form characterized by a thick body and having conchoid facets resulting from lack of carrying power in the flake-producing impact. In America by far the greater portion of flaked implements are flat to thinness, and usually somewhat leaf-shaped in outline, or are produced by elaborations of a leaf-shaped outline, as the spear-point, arrow-point and drill. In making these forms all that could not be reduced readily to the required degree of tenuity were either broken in the attempt to reduce them or became hopelessly deformed under repeated abortive blows. The thick-bodied flaked stone of approximately leaf-shaped outline is the reject *par excellence*, and probably outnumbers the successful forms—the implements produced—two to one. It is widely distributed, occurring in greatest numbers on or near the sites yielding the raw material and especially, in countless numbers, in the shops surrounding the great quarries of quartzite, flint, jasper, chert, novaculite, argillite and rhyolite. It happened in some cases that the raw material or the more rudely outlined forms were carried away from the quarries to be shaped at leisure on distant sites; turtlebacks are, therefore, occasionally found widely scattered, but in the nature of things this is exceptional. Economy of labor in transportation would require that the material be tested for workability, and reduced as much as possible in weight before removal began.

All of our American flaked tools are, however, not thin and blade-like in outline; picks, chisels, celts, adzes, hatchets and axes are thick intentionally, and the rejects of their manufacture and they themselves should not be confused with rejects of the thin forms. Such tools were, however, seldom made in great numbers, and in many sections are rare or wanting, and, so far as the great quarries already studied are concerned, they constitute no considerable feature. When found scattered over the fields such forms cannot readily be distinguished from the refuse of blade-making, save where specialization has taken place, use has left its mark, or distribution or association affords clues. Rejectage as well as breakage varies with each implement, with the variety of implement and with the material.

Nuclei. Another usual consequent of manufacture, especially where the finer qualities of flint and the glassy rocks were worked, are the nuclei or cores left after the removal of successive flakes for

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knives or for subsequent shaping. Generally these objects are readily distinguished from other classes of refuse by the number and uniformity of their facets, which give a fluted effect.

Hammer-stones. Associated with the refuse of shaping are the various tools utilized in the work. These are mainly hammers of stone, globular or discoidal in shape and bearing marks of the manner of their use. It often happens that the periphery of the disk is so worn as to indicate clearly whether the workman was right or left-handed. In size there is wide range. The larger specimens, used in breaking up the stone where massive, are as much as ten inches in diameter. The smaller, used in finishing the more delicate blades, are not above an inch in diameter. The hammers are usually of heavy, compact rock, and are often bowlders and pebbles from outcrops or stream beds near the quarries; not infrequently they were re-shaped by flaking.

EVOLUTION OF SPECIES.

That nothing springs into being without cause and that no highly-developed form comes into existence without predecessors and ancestry, may be as safely maintained of art as of nature. The existence of a highly-specialized group of implements implies a long line of antecedent groups reaching back to an original primal form having no such phenomena as variation or specialization. This necessary relation of the last to a first and the order of procession from the one to the other may be readily expressed in diagrammatic form. I present two diagrams, the first illustrating the evolution of a single species of implement with phenomena of shaping at successive steps of progress, and the other indicating the morphologies of specialization and differentiation of the whole group of species. Assuming that in Diagram III. we have at the base *A* the inceptive point of the shaping arts, or, better, the first step in the manipulation of stone, and that the series *B*, *C*, at the top, represents the development of an individual,—the arrow-head,—we may fill up the interval between by any number of developmental series representing successive steps in the history of the arrow-head species. The intervals between the lines may be regarded as representing the period of time necessary to the accomplishment of a step in differentiation and specialization. The number of steps may be large or small, but I have introduced about as many as there are varieties of flaked implements in use by an ordinary community of people. We can have little definite knowledge of the shape of the ancestral implement or of its particular functions at any given step of

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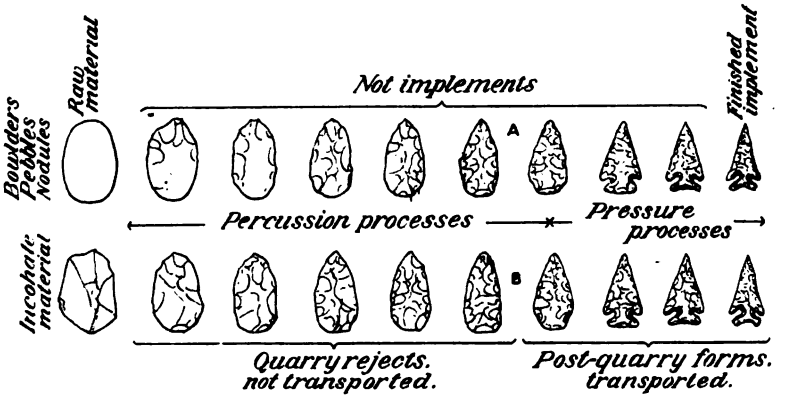

DIAGRAM II.—MORPHOLOGY OF THE SPEAR POINT.

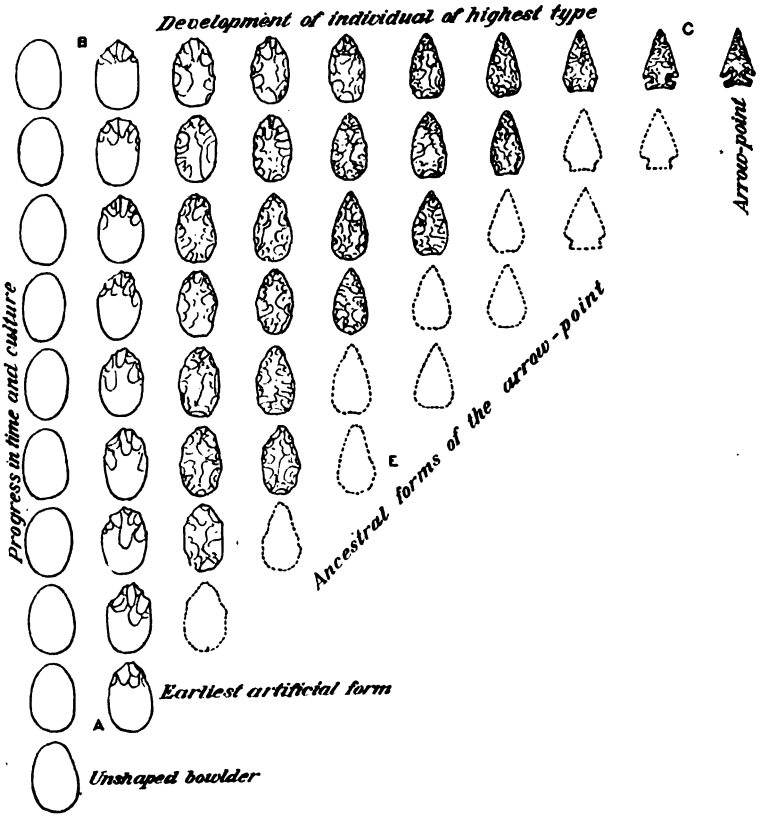

DIAGRAM III.—STEPS IN THE EVOLUTION OF SPECIES.

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progress. I, therefore, leave indefinite the final shapes at the right. The arrow may include in its ancestry one or all of the species of flaked implements. It may have had a mixed parentage, as, for example, through a wood or bone tool as to hafting features, and through the stone knife as to its incisive shape. I have not ventured to give any of the ancestral steps or implement groups a name, but if the arrow is the outcome of the less simple devices in stone preceding it, the order of progress would repeat somewhat closely that indicated in Diagram I., the order being that of increasing complexity.

The manner here adopted of representing the evolution of a group or species of implements by a succession of manipulative series is intended to aid in a comparative study of the rejected forms, a matter of much importance in the discussion of questions of progress and time. It will be seen that the steps of progress in manufacture represented by rejected forms pertaining to each implement in Diagram I. necessarily duplicate somewhat closely the corresponding steps of manufacture in Diagram III., although the steps in the former are all of one time, and the latter represent all times.

The facts to be especially brought out are these: The conditions of art in stone are such that the simpler forms of flaked implements employed in cutting, picking, scraping and striking are necessarily shaped by like processes, pass through like changes of form and reach closely identical results, whether made by a people of low culture grade doing their best work, or by a people of high culture doing their rudest work. The early shapes will be repeated in the later shapes, and the refuse of rejection will, in the nature of things, up to the stage where specialization begins to take effect, be largely identical. The finished implement belonging at *A* in Diagram III., a paleolithic position, may be practically duplicated through all the ages along the vertical line *A*, *B*, in Diagram I. So the blade appearing first as an ancestor of the arrow, say at *E* in Diagram III., is repeated practically in all the blade forms of subsequent ages and in all the blank forms of all implements of blade genesis.

The evolution of species of implements, as of species of animals or plants, is a progress accompanied by specialization and differentiation of form. An implement of the simplest type under stress of human needs is elaborated to increase its efficiency and is specialized to fit it more fully for a particular use. Uses multiply and the specialization takes different directions, diverging and differentiating until the results are complex and numerous species of implements exist.

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This process may be expressed to the eye, but it is impossible with our limited knowledge of the details of morphology at the various stages of development to give concrete examples covering the whole ground. We know that progress of certain kinds took place and that advancement was along certain general lines reaching well-known results, and the general truths of this progress are expressed in Diagram IV. In this diagram the idea of individual morphology and the whole group of phenomena incident to manufacture are entirely omitted, the relations of genetic succession of the various groups of implements being alone kept in view. The diagram is made to include the full range of primitive work in stone, as none of the processes by means of which the groups are developed are independent of the others throughout their history. The more typical flaked groups are placed on the left, the pecked, abraded and incised following to the right. It is not possible to determine definitely the order of procession, the parting, crossing and intercrossing of lines. The radical shaping processes, fracturing, battering, abrading and incising, each give rise to species and groups of species of implements, partially enumerated and tentatively placed in the diagram. The attempt to trace a particular final form back to the beginning would be futile, although in some cases a probable course of progress can be made out, as with the arrow-point, which connects back no doubt through the spear-point and the knife with the primal sharpened stone. A notion of the comparative complexity of the phenomena at succeeding periods of time and stages of progress may be obtained by comparing the groups of radiating lines at the points crossed by the four concentric lines *A*, *B*, *C*, *D*.

Evolution of implements carries or has associated more or less closely with it other groups of evolutional phenomena which could be given separate consideration to good advantage; these include the evolution of processes, of form, of function, of trade, of transportation, etc., but the discussion of these topics would extend this paper beyond the limits set for it.

Attention has been called to the great importance of thorough analysis of the phenomena of art, and especially to the most exhaustive study of the fragmental materials of archæology. An analysis, not yet fully perfected, of flaked stone art has been attempted, in which much weight is given to the idea that art should be studied as natural history is studied, that objects of art must not be treated as independent individuals merely, or as groups of individuals associated

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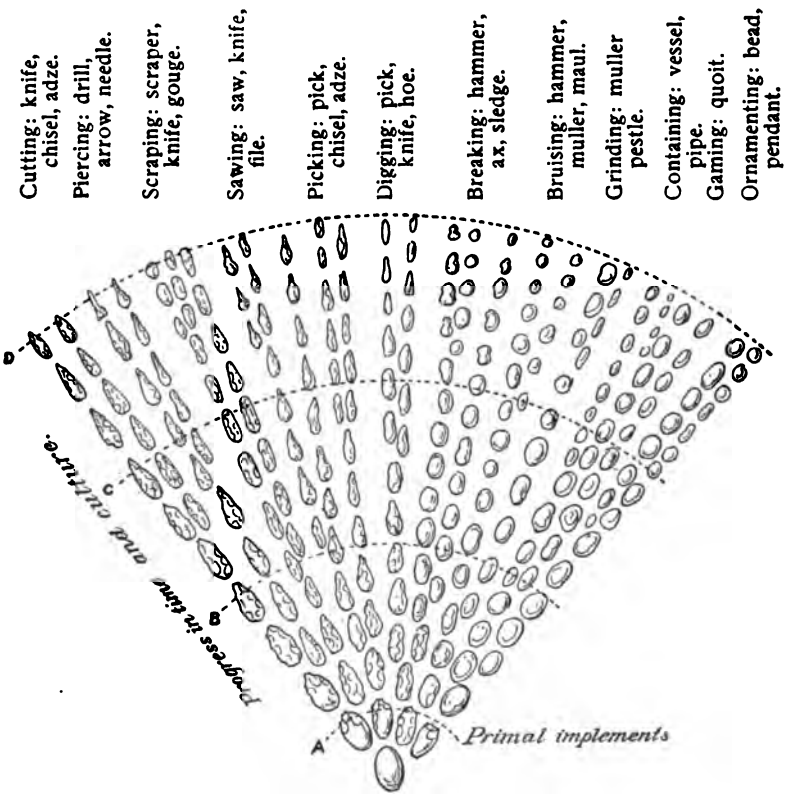

DIAGRAM IV.

EVOLUTION OF SPECIES OF STONE IMPLEMENTS BY DIFFERENTATION AND SPECIALIZATION.

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by superficial characters for convenience of description, but as phenomena to be rightly understood only through their relationships with the whole scheme of nature, viewed in the light of evolution. It has been shown that the utilization of works of art as the materials of history is unsafe until the whole group of phenomena has been considered with respect to origin, genesis and all the details of morphology and development.

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CACHE FINDS FROM ANCIENT VILLAGE SITES IN NEW JERSEY.

BY ERNEST VOLK.

IT has been stated that the rudely chipped argillites so frequently found on the gravel and village sites in the Delaware Valley were nothing further than rejects made by the recent Indian. Able and efficient men have discussed this subject time and again, and much has been said for and against the statement.

My recent explorations in the Delaware Valley have brought facts to my knowledge which bear, I think, upon this subject, and I will relate them here in brief on the contents of pits and caches on old village sites near Trenton, New Jersey. A paper read by me at the Madison meeting of the A. A. A. S. a short time ago states that argillite was used differently, in manufacturing implements on or near the surface, than by its earlier comers, whose traces lay nearly 3½ feet below those of the last occupants of that locality. We find on examining the lowland village site that we have many pits on the northern end of the village that come within nine or ten inches of the present surface. These were undoubtedly the latest ones in use, and among these we have several that contain exclusively nothing but very thin argillite chips—in all the higher pits—that is, in those that are reaching near the surface. Two of these especially have round black chert pebbles, much worn by use; also round quartzite pebbles of small size are found with them among the chips. These pebbles have been apparently used in detaching the thin chips from a ruder body already reduced to a smaller size; in other words, these chips were made in finishing an implement.

The soil in this locality is of a sandy leaf mould and loam, and does not contain a single stone or pebble naturally; therefore all we find here were brought by these people. The Delaware River, which is only about one mile off to the southwest, is the only source from which this material could have been brought. The argillite being plentiful there, there is no reason why these people should not have made use of it, the same as they did of the large flat stones and the large water-worn pestle-shaped pebbles of which we have found so

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many in the pits. Among these pits we find also near the surface a cache of rudely chipped argillites, one here and one on the highland or terrace village site. This contains fifteen specimens ten inches below the surface, and the other on the highland is thirteen inches below the surface and contains seventeen specimens. They are in both cases arranged in three layers, the lower one being the largest in space, the top one the smallest, the specimens touching each other. These have apparently been stowed away to be finished at leisure.

The several pits near the surface, and really all the thin chips found in those upper pits, are evidently the result of a finishing process upon those argillites, rudely chipped somewhere else and brought into camp to be finished.

In the summer of 1891 I examined forty-six miles of the shore and bed of the Delaware River, as far up as Milford, New Jersey, which is ten miles above the argillite outcrop at Point Pleasant and thirty-four miles above Trenton, and I went as far as twelve miles below that city. In these trips along the shore and bed of the Delaware I noticed a continuous line of workshops, where exclusively argillite was worked. Many were situated on the bluff, but more in the so-called spring freshet line or wash-out. They all contained rude flakes of argillite, together with broken quartzite pebbles evidently used as hammer-stones. Here argillite was rudely chipped and then taken away, to be finished at home. I stated this two years ago in my notes on river explorations for the World's Columbian Exposition.

The pits of argillite chips showing the total absence of rude or course flakes, and the caches showing the rudely chipped argillites, would necessarily give rise to the question: Can those rudely chipped argillites be called rejects?

A few more facts will help to throw further light upon the subject. There seems to be a great difference in the rude chipping of argillite, not only in the way of chipping, but also in the nature of the material and the knowledge of the difference by the operator.

The specimens that are found on and in the gravel of the Delaware are, as a rule, very thick, with a still thicker part, the so-called butt-end, and that notorious hump which has caused the name "turtleback" and cannot be mistaken for the quarry specimens from Point Pleasant quarry, explored by Mr. Mercer, of Doylestown. These specimens are much flatter and thinner and show less flake faces, and no hump nor butt at all. These chippings are undoubtedly due to the full knowledge of the cleavage by the operator of the unex-

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pose solid rock; consequently the mining or quarrying of the same. This knowledge must have been the result of the chipping of the river material and succeeded the same.

Another is the manufacturing of implements from flakes of argillite. Such were apparently saved and stored away for future use, as the cache on the lowland village site in my collection plainly illustrates. It was seemingly a wasteful way to these last inhabitants of this place to begin to manufacture a small implement out of a large piece of material or rock and to have so much material to get away with. It is also an evidence of advanced skill over that of the first comers at this habitation site, and a proof that a smaller implement had become necessary to them. The manufacture of implements from flakes is not new, and we find in the collection of Mr. G. A. Dorsey, from Peru, flint flakes of a rude nature stored in a net bag, together with the hafted arrow-points of the same material, all found with a skeleton in a grave.

The existence of rejects in places where chipping has been done can not be disputed, but neither can we classify all rude chipped argillites as rejects or unfinished implements. An extensive study of the art of chipping, especially of this material, is necessary to enable the student to identify the rude implements from the unfinished ones and from the rejects.

Some of the rude forms we find in the cache in the terrace village site (Wright's field) bear a striking resemblance to those specimens generally found on and in the gravel in the Delaware Valley.

The accompanying illustrations show twelve of the seventeen specimens found in the highland cache, face and edge view of each specimen.

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ETHNOLOGY.

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ETHNOLOGY.

ON VARIOUS SUPPOSED RELATIONS BETWEEN THE AMERICAN AND ASIAN RACES.

BY D. G. BRINTON.

THE isolation of the American race from the earliest prehistoric times seems to have been so complete that any positive evidence that it was perceptibly influenced in its development, either physical or psychical, by any other race, is exceedingly scant, if it exists at all. As for myself, though certainly willing to welcome any clear testimony to such influence, I have been unable to find any which will bear even slight examination. To illustrate this, I shall in this paper briefly review a number of recent assertions as to the supposed relations between the American and Asian races in comparatively recent or ancient times, and see if they have any real bearing on the question, or are of value in its solution.

I should naturally begin with a study of the alleged physical resemblances between the two races; but I may be dispensed from that, as but a few years ago I had the honor of reading before the American Association a paper disproving the alleged Mongoloid resemblances of the American race.* When this paper was published, it was vigorously attacked by Dr. Ten Kate, but has since been amply supported by the researches of Fritsch, of Berlin, on the hair of the American Indians, and of Virchow, on their skulls. In the *Compte Rendu* of the Congress of Americanists for 1890, Dr. Ten Kate, indeed, repeats his Mongoloid theory, offering no new evidence, but is astonished and sad at the defection of his fellow-countrymen, especially Fritsch, from his favorite hypothesis. The defection, however, is steadily growing, and Dr. Ten Kate will soon be the only ethnic anatomist of repute who lays much stress on the points of resemblance he has noted.

Of late, much more has been made of the resemblances of arts, religions, traditions symbolisms and languages, than of physical

*Reprinted in my *Essays of an Americanist*, pp. 55–66 (Phila. 1890).

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traits; so to these mental products I shall now turn, to see what they are alleged to offer in proof of some former connection between the people of the two continents.

Of course, everybody knows that across the narrow straits of Behring there has been going on a commercial interchange for untold generations. For time out of mind, several large fairs have been annually held on the west coast of Alaska at various points to which representatives of Asiatic tribes journeyed, bringing with them the products peculiar to their continent, including slaves, both male and female, which were bartered for such American commodities as were desired. In an article printed about a year ago, I gave, from information furnished me by officers of our navy, the localities and seasons of these fairs.* By this agency many articles from various parts of Siberia, and doubtless also many customs, and more or less Asiatic blood, were introduced into the tribes of the extreme Northwest, the Tlinkit, the Tinneh, and especially the Eskimos.

Through this channel I would explain the transmission of the Chinese temple-coins found as the eye-pieces of a wooden mask in an ancient Chilcat grave by Lieut. T. Dix Bolles, a few years ago.† He acknowledges that the objects could claim no great antiquity, as the mask still retained, even in that wet climate, a sparse fringe of human hair around it. He guesses the age of the grave at two hundred years, which we may well allow.

To the same source we may attribute those customs of the Western Eskimo to which Mr. John Murdoch has assigned a Siberian origin, such as the general use of tobacco in pipes of a peculiar form; the employment of nets in fishing; and the art of catching fowls by means of small stones at the end of a cord, known as "bird-bolas." Mr. Murdoch does not pretend that these testify to any very ancient communications between the two continents; on the contrary, his words are: "That these customs were acquired at a comparatively recent date is shown by the fact that they all stop short at Cape Bathurst."‡

The Asiatic origin of the Eskimos has been a favorite subject with several recent writers. They are quite dissatisfied if they cannot at least lop these hyperboreans from the American stem, and graft

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* Printed in *Science*, May 20, 1892.

† Bolles, "On Chinese Relics in Alaska," in *Proc. National Museum*, Vol. XV.

‡ Murdoch, in *American Anthropologist*, October, 1888.

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them on some Asian stock. That worthy student, the Abbe Emile Petitot, has published in the *Bulletin de la Societe Normande de Geographie*, for 1890, a brief setting forth this side of the case. He marshals the evidence, first, from the traditions of the Eskimo, which he asserts trace the ancestral horde back to Asia; secondly, he presents what he claims are numerous linguistic analogies of the Eskimo to the Ural-Altaic tongues; and he concludes by pointing out many resemblances in customs. It seriously militates against the supposed linguistic analogies that they are denied flatly by Dr. Heinrich Winkler, probably as good an authority as any on the Ural-Altaic tongues; while the value of tradition on this question cannot be rated very high, and the similarities of custom are such as obtain between any two tribes of about the same grade of culture the world over.

The recklessness with which such statements are sometimes made is illustrated by the following sentence beginning a paper by M. Desire Charnay in the *Compte Rendu* of the VIIIth session of the Congress of Americanists: "The traditions of the civilized peoples of America state that they came from Asia, and all speak of their rafts and houses of wood, *acalli*, in which the emigrants crossed Behring Straits." The assumption in this sentence that the early nations of Mexico were acquainted with the continent of Asia and the Straits of Behring is something sublime in its audacity. The writer goes on to find analogies between the culture and customs of Mexico and those of China, Cambodia, Assyria, Chaldea and Asia Minor. I grant he finds plenty, but I ask, Are we therefore to transport all these ancient peoples, or representatives of them, into Mexico?

What kind of analogies are those on which these writers rely to establish their thesis of an Asiatic immigration? I shall quote a number advanced by that excellent antiquary, M. Eugene Boban, in a work published in Paris last year.* He says that certain of the Mexican tribes are "*bien certainement*" of Chinese origin, because they have arts which are just alike. Both nations, for instance, made paper; both tanned leather, cut and polished precious stones, worked feathers into dresses and ornaments, moulded pottery, cultivated gardens, named their children after stars and flowers, and so on. He well says that he could "*remplir bien des pages*" with such analogies. So he could: as that the people of both nations slept at night; that they ate

* *Catalogue Raisonnés de la Collection Goupil*, Tome II., pp. 65, 66.

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both meat and vegetables when they could get them; that they wore clothing when it was cold, and equally surprising coincidences.

But the inner stronghold of those who defend the Asiatic origin of Mexican and Central American civilization is, I am well aware, defended by no such feeble outposts as these, but by a triple line of intrenchment, consisting respectively of the Mexican calendar, the game of patolli, and the presence of Asiatic jade in America. I shall attack them *seriatim:* and first for the calendar.

Alexander von Humboldt is responsible for assigning to the calendar in use before the conquest throughout much of Mexico and Central America an Asiatic origin. He declared that it was derived from that in current use by Thibetan and Tartar tribes; and so great has been the weight of his authority that even such a writer as Dr. Edward B. Tylor does not hesitate to say that Humboldt "proved" this assertion;* and the learned Mexican archæologist, the late Orozco y Berra, also accepted it without hesitation.†

Yet, in fact, there is absolutely no similarity between the Thibetan calendar and the primitive form of the American, as we find it among the Zapotecas, which form Orozco y Berra himself acknowledged was at the basis of all others found in Mexico or the adjacent regions. The American calendar was not intended as a year-count, but as a ritual and formulary. Its signs had nothing to do with the signs of the zodiac, as had all those in the Thibetan and Tartar calendars; and, moreover, we can trace it developing in quite different directions during the process in various tribes of bringing it into relation with the civil year-count. No one who will carefully trace the evolution of the Mexican calendar through the variations it assumed among the Maya tribes, the Nahuas, the Tarascos and the Mixtecas, can harbor any further doubt about it being a wholly indigenous American production. Humboldt himself said that the calendar of the Chibchas of South America more closely resembled those of Central Asia than did that of Mexico.

I next turn to the game of *patolli*, which, according to Dr. Edward B. Tylor, was an adaptation by the ancient Mexicans of the game of *parchesi*, familiar to-day in Hindostan.‡ It is a game allied to backgammon, and in Mexico was played with beans marked on one

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* In the *Journal of the Anthropological Institute of Great Britain*, 1878.

† In his *Historia Antigua de Mexico*, Tom III., cap. VIII. (Mexico, 1880.)

‡ Dr. Tylor's article is in the *Journal of the Anthropological Institute* for 1878.

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side, which took the place of dice. This game has lately been made the subject of careful study by Mr. Culin, of the University of Pennsylvania, and Mr. Frank Cushing, of the Bureau of Ethnology; and I am authorized to say that both these competent authorities agree that there can be no doubt but that *patolli* is thoroughly American in origin, no matter how closely it assimilates the East Indian game.

Having disposed of the calendar and *patolli*, I shall next pick up the article of jade, and see what it tells us about the Asian immigration, growing now somewhat hazy. Jade and its significance is a favorite subject with our distinguished member, Professor Putnam, and he has in various passages of his reports of the Peabody Museum at Cambridge spoken of the potent testimony it renders to the ancient commerce and interchange of arts and art-products between America and Asia. The force of the argument lies in the assumption that certain ancient implements of this material discovered in America are in a variety of it not obtainable outside of Southern Asia.

Professor Putnam and his associates in this opinion are not willing to accept the decision of Dr. A. B. Meyer, of Dresden, that jade, jadeite and nephrite are found so widely over the world, and of so many varieties, that it is no longer admissible to found upon them an ethnologic theory; they have not been convinced by the admirably thorough paper by Dr. Virchow before the Congress of Americanists, in 1888, indorsing fully the opinion of Dr. Meyer; they reject the words of that competent authority, Dieck, at the same congress, when he said: "We have no occasion to call in the aid of a Mongoloid or Asiatic immigration to explain the presence of these green-stone tools in America." More than this, they seem to be undisturbed by the yearly discovery of more and more localities where jade is found *in situ* on this continent, and the presentation of objects in this stone from new regions, as those sent by Dr. Ernst from Venezuela. Others, however, must admit that no variety of jade whatever, from a purely mineralogical point of view, can attest ethnic wanderings.

It seems scarcely worth while seriously to consider the evidence brought forward from tradition and so-called pre-Columbian history. The hoariest records there are anywhere in America trace the migrations of tribes for not more than a very few centuries previous to the discovery by Columbus; and, by any fair construction, never beyond a short distance from the nation's central station. Even with regard to the ample and reasonably ancient traditions of the Nahuas, of the Valley of Mexico, we may safely adopt the opinion of the learned

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Ramirez, that the geographical area to which they refer will scarcely carry us beyond the limits of the valley itself.

That there should be frequent parallelisms in the religious traditions, the myths, and the stories of gods and demi-gods, will surprise no one who has extended his studies of comparative mythology over the savage races of all continents. The development of the religious sentiment, the gropings of man in the dark, to find out and define to his intelligence the mysterious power which masters the storm, moves the stars, and visits death and life, fate and fortune, on the sons of men, bear in all times and climes an almost fixed relation to the general intellectual development of the individual and the community. The same is substantially true of folk-lore and of many institutions of social life and family ties. The day is certainly past when an ethnologist of ripe culture will prefer the genealogic to the anthropologic explanation of such similarities, even if they progress to identities.

The same is doubly true of symbolism. I do not deny that we find on American soil and among primitive American tribes the sacred symbols of the Orient, *svastika* of the Aryans, the *tai ki* of the Chinese, the cross of Christianity. The circle, the quadrilateral, the triangle, the serpent, the bird and the tree, the sacred numbers three, four and seven, the significant members, the hand, the tongue and the phallus—all these and many more possessed to the dark-hued tribes of America as mysterious and as pregnant a significance as they did to the worshipers in the temples by the Nile, or to the white-robed priests in the isles of Greece.

This is, indeed, matter of amazement, food for reflection; but our amazement springs from the consideration how man, everywhere different, is yet everywhere the same; and our reflection is that, whatsoever is his history, by whatsoever environment he is surrounded, in his slow progress from the darkness of savagery to the light of civilization he treads the same path, aids himself by the same weak supports, and seeks the same material wrappings in which to swathe the feeble progeny of his intellect and imagination.

I have reserved for the last the linguistic question: Do any of the numerous languages and innumerable dialects of America present any affinities, judged by the standards of the best modern linguistic schools, which would bring them into genetic relationship with any of the dialects of Asia?

I believe I have a right to speak with some authority on this subject, for the American languages have constituted the principal study

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of my life; and I say unhesitatingly that no such affinities have been shown; and I say this with an abundant acquaintance with such works as *The Prehistoric Comparative Philology* of Dr. Hyde Clarke; with the writings of the Rev. John Campbell, who has discovered the Hittite language in America before we have learned where it was in Asia; with the laborious *Comparative Philology* of Mr. R. P. Greg; with the *Amerikanisch-Asiatische Etymologien* of the ardent Americanist Mr. Julius Platzmann; with the proof that the Nahuatl is an Aryan language, furnished by the late director of the National Museum of Mexico, Senor Gumesindo Mendoza; with Varnhagen's array of evidence that the Tupi and Carib are Turanian dialects imported into Brazil from Siberia; with the Abbe Petitot's conviction that the Tinneh of Canada is a Semitic dialect; with Naxera's identification of the Otomi with the Chinese; and with many more such scientific vagaries which, in the auctioneer's phrase, are too tedious to mention.

When I see volumes of this character, many involving prolonged and arduous research on the part of the authors and a corresponding sacrifice of pleasant things in other directions, I am affected by a sense of deep commiseration for able men who expend their efforts in pursuit of such will-o'-the-wisps of science, panting along roads which lead nowhere, inattentive to the guide-posts which alone can direct them to solid ground.

What one of the works I have mentioned respects those principles of phonetic variation, of systematic derivation, of the historic comparison of languages, of grammatic evolution, of morphologic development, which are as accurately known to-day as the laws of chemistry or electricity? Not one of them. And yet to attempt comparisons in disregard of these laws is as insensate as to start on an ocean voyage without a compass or an instrument of observation. The craft is lost as soon as it is out of sight of land.

I maintain, therefore, in conclusion, that up to the present time there has not been shown a single dialect, not an art nor an institution, not a myth or religious rite, not a domesticated plant or animal, not a tool, weapon, game or symbol, in use in America at the time of the discovery, which had been previously imported from Asia, or from any other continent of the Old World.

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BARK CLOTH.

BY WALTER HOUGH.

[Abstract.]

THE paper described the process of producing a useful fabric from the bast of certain trees, softened and extended by beating with grooved clubs, and the finished cloth, or felt of various degrees of texture, from that of the Talamancas of Costa Rica to the delicate stuffs made by the Polynesians.

The necessity of the employment of the club with grooves was explained, and the usual appearance of this feature wherever bark cloth is made, or where bark is softened, as on the northwest coast of America. The connection of the grooved stones found in Mexico and southward with this art was pointed out.

The range of the bark cloth industry was shown to be very wide. It includes Central America, the West Indies, South America, Africa, among nearly all tribes, India, the Pacific Islands to the extreme outlier Easter Island. The Australians pound out bark to make bags.

Ancient classical references were given from Strabo and Theophrastus, and in India from the Vinaya Mahavagga and the Jataka.

The multifarious uses of bark for paper-making, basketry, matmaking, cordage, utensils, etc., etc., were spoken of.

It was pointed out that for the production of stuffs for clothing, etc., the bark-beating apparatus has in most cases preceded the loom.

This industry is almost wholly confined to tropical or sub-tropical countries, depending upon the range of trees in which the filaments of the bast are interlaced.

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LOVE SONGS AMONG THE OMAHA INDIANS.

BY ALICE C. FLETCHER.

IT is well known that Indian ceremonies, both religious and secular, are enveloped in song. Public ceremonies and all ordinary avocations can be observed without difficulty, but many obstacles arise when a student would penetrate into the mysteries of secret societies and ceremonials, and these obstacles increase as he approaches the Indian's personal habits and experiences. As a result of these obstacles, which are enhanced by the Indian's shyness and reserve upon all personal matters, the statement has gone abroad that he, whose every act is set to music, so to speak, is silent when moved by the emotion of love, and that he knows no wooing such as is recognized among more advanced races.

Mr. Herbert Spencer, in the postscript to his essay on the Origin of Music, published less than three years ago, writes: "Out of all the testimonies" (and these testimonies include statements concerning the North American Indians) "there is not one which tells of a love-song spontaneously commenced by a man to charm a woman."

During the last dozen years I have spent much time in the patient study of Indian music in a number of tribes belonging to different linguistic stocks, and have transcribed hundreds of their songs. These cover a wide range of ceremonial and personal experiences, and include courting or love songs.

My present illustrations will be drawn from the Omaha tribe, for the reason that a number of Omaha songs have recently been published by the Peabody Museum of Harvard University, and are available for reference.

A study of the songs of the various Indian tribes of this country gives glimpses of the unfolding of the emotional nature of the race, and reveals evidences of growth in the power of expression. In these songs we come near to the beginnings of the kindred arts of music and poetry, and note how apparently the early metrical expression of emotion was in music rather than in verse, and that it was the rhythm of the song that moulded the words into metrical numbers.

In all primitive music rhythm is strongly developed. The pulsations of the drum and the sharp crash of the rattles are thrown against

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each other and against the voice, so that it would seem that the pleasure derived by the performers lay not so much in the tonality of the song as in the measured sounds arrayed in contesting rhythms, which by their clash start the nerves and spur the body to action, for the voice, which alone carries the tone, is often subordinated, and treated as an additional instrument. Our Indian songs partake somewhat of this primitive character. In them rhythm is strongly marked, and often we find two or more rhythms contesting with each other through all the intricacies of syncopation. The skill the Indian displays singing in one rhythm and drumming in another is not a mark of highly developed musical sense, but, on the contrary, belongs to its earlier manifestations. Much practice would be required to enable us to imitate his surprising performance, our ears having been trained more especially in tonality and simple rhythms. It seems to be as true of the race as of the child, that in the development of the musical sense delight in rhythm precedes tone perception.

There are many Indian songs, however, in which tonality rises into prominence and rhythm is felt in the musical phrase rather than merely in the drum-beat. Such songs evince an advance in power of expression, the growth of higher emotions and sentiments having demanded a higher type of utterance.

The general idea associated with song is that the musical tones act as a vehicle to the words, bearing them above their literal meaning, and even the ancient Greeks held that music without words was hardly worth consideration, save as a curiosity, but as we trace our way back to early song we find that the importance of words in the explanation of tones and cadences diminishes as we proceed. Indian songs that are fully supplied with words are the exception. Musical syllables from which the sibilants and gutturals are eliminated, leaving only the flowing vowel sounds, are used to float the voice. These musical syllables, once fastened to a song, are preserved as faithfully as though they were text. There are many songs having a few words only, musical syllables filling out the measures. There are other songs in which the few words used have their accents changed, or are taken apart and stretched by the interposition of musical syllables, and the phrase made elliptical to suit the rhythm of the music, which in its turn voices the rhythm of the emotion. Such songs are interesting as affording a study of the beginnings of poetry, of the bending of words to form a metrical setting to the thought.

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We do not easily understand how vocal music without words can convey any definite meaning, and it may be suggested that such songs find their interpretation in the acts of the ceremony of which they form a part. An instance to the contrary can be found in the Omaha funeral song, No. 57 in the monograph. This blythe major melody is furnished with musical syllables only. There are no words to explain the startling contrast of the soug with the bloody ceremony of which it forms a part. To understand what this song conveys to the Omaha Indian, one must be familiar with his belief concerning the future life of the soul. The absence of words, therefore, does not prevent the Indian's apprehension of a certain definiteness of expression in musical tones.

It is impossible to understand any act of an Indian without considering the all-pervasive power of his tribal organization, an organization that took no account of the individual, permitted no personal responsibility or personal freedom, and which bound his mind in the meshes of religious, ritual and gentile obligation. Marriage was therefore an affair of the gentes and not the free union of a man and woman as we understand the relation. The laws of the gens held them apart, and their children never became the inheritors of both parents. The ceremony of marriage was often a formal affair, affording little chance for the play of love's young dream; but side by side with these restrictive ceremonies grew up the custom of secret courtship and elopement. So they say: "An old man buys his wife; a young man steals his."

The Indian mode of life was such that the morning and evening visit to the spring, to dip up water for the family use, gave the only opportunity for lovers to meet. It is true that the daughter seldom or never went alone to the spring, but it holds as good in the Indian country as elsewhere, that all the world loves a lover, and the chaperoning elder woman often devised friendly little absences, that the youth who had made his presence known by his song might gain a few words with his sweetheart. The scene was simple: the birds and flowers, the morning glow and stirring breeze were the only witnesses, and they would not betray the lovers. These honorable secret courtships were never talked of or sung about. The veil of silence was never withdrawn from these morning moments at the spring, not even if the marriage proved disastrous and the tie was broken.

But there are songs that deal with what are lightly called love-affairs, intrigues which were more or less contrary to established so-

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cial order. The Omahas called these songs *Wa-oo-wa-an*, or woman songs, not that they originated with women, or were ever sung by them, but because they described experiences in which women had played a part. A song of this class was frequently composed by the very man who in it recounted his own adventures, but he tells the story as though it was the woman who spoke. Although the young men and old beaux who affected these songs never sang them in the presence of women, they were dreaded by the sex as a sort of derisive scourge. These songs were seldom ribald, and sometimes the violation of the social code implied in the narrative would have passed unobserved in any other society than tribal.

There are humorous bits in some of these songs, as in one which, freely translated, gives the picture of the gay youth sitting upon a hill overlooking the village that is buzzing over his escapades. As the murmurs are wafted up to him, he complacently throws all responsibility upon the gods who made him as he was—irresistible!

The *Wa-oo-wa-an*, woman songs, were more fully supplied with words than the songs of any other class, and are interesting as a study of the beginnings of ballad-making. They are in no sense love-songs; they have nothing to do with courtship and are reserved for the exclusive audience of men.

The true love-song, called by the Omahas *Bethae wa-an*, an old designation and not a descriptive name, is sung generally in the early morning, when the lover is keeping his tryst and watching for the maiden to emerge from the tent and go to the spring. They belong to the secret courtship and are sometimes called *Me-the-g'thun wa-an* —courting songs. *Me-the-g'thun* signifies the act of courting or wooing a woman to wed. They were sung without drum, bell or rattle, to accent the rhythm, which in these songs is subordinated to tonality and is felt only in the musical phrases. The singer used much liberty in rendering the music, the time was not strict, and the voice lingered and died away in the long notes. Vibrations for the purpose of giving greater expression were not only effected by the tremolo of the voice, but they were enhanced by waving the hand, or a spray of artemesia before the lips, while the body often swayed gently to the rhythm of the song. This mode of rendering love-songs was in strong contrast to the usual habit of singing in exact time to sharply accented rhythmic beats.

As the tribal organization reduced the personality of a man to the minimum, any evidence of the activity of the vital principle of

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individuality becomes exceedingly valuable wherever found, and these love-songs present such evidence. In them we discern the freer use of tonality, for tonality permitted a greater play of personal feeling than could be obtained through strong rhythms, however complicated; their flowing cadences voiced a longing that had made the youth conscious of his individuality, of his distinctness from the mass of men in his gens. This dawning consciousness of his individuality in the longing for something not his own—an ideal, if you will—vindicated the stirring of the principle of personal freedom to choose and to act.

Although there is a marked subjectivity in the music, there is also a concentration of feeling and purpose, and at the same time a reaching-out toward nature, a taking into his confidence of the woods, the birds and the sunlight, in the joy of his own experience. The few words in these songs convey the one poetic sentiment: "With the day I come to you;" or, "Behold me, as the day dawns."

Few unprejudiced listeners will fail to recognize in these *Bethae-wa-an*, or love-songs, the emotion and the sentiment that prompts a man to woo the woman of his choice.

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PRIMITIVE SCALES AND RHYTHMS.

BY JOHN COMFORT FILLMORE.

I WISH to give at this time a *résumé* of such studies as I have been able to make in the primitive music accessible at the World's Fair, and a comparison of the results of it with those of my previous studies. Perhaps I cannot do better than begin with an account of my studies of the songs of the Vancouver Indians, carried on in company with Dr. Franz Boas, who has them in charge. To his kindness, friendly sympathy, scientific knowledge and long experience among these Indians I owe whatever I have been able to learn about their music; and I trust he will further sympathize with me in the conviction that our combined efforts have not been without valuable results. I begin with this Vancouver Indian music because it is clearly of a much more primitive type, much more near the beginnings of music-making than any Indian music which I have heretofore had opportunity of studying at first hand, and consequently is peculiarly interesting from a scientific point of view. I was extremely curious to see whether certain conclusions which had shaped themselves in my mind as the result of previous studies in folk-music would hold good here also, or whether they might have to be modified by the results of study in music of a decidedly more primitive type. It will be best, I think, to give a somewhat detailed account of this study before saying anything about the inferences to be drawn from it.

My first experience of the music of the Vancouver Indians was on the evening of July 7th. On that evening Dr. Boas kindly invited a number of us to witness some dances of these Indians, accompanied, of course, by singing. Among them was a cannibal dance, which is certainly very old. From this performance I carried away some very distinct impressions; but I made no notes, partly because I could not, in any case, write as fast as the Indians could sing, partly because I wished to get the general impression before studying details, and partly because the performance came at the end of a most exhausting day of extreme heat and constant tension, which hardly left me strength for anything but general impressions. My really serious study of this music began a month later, on the 8th of August, when

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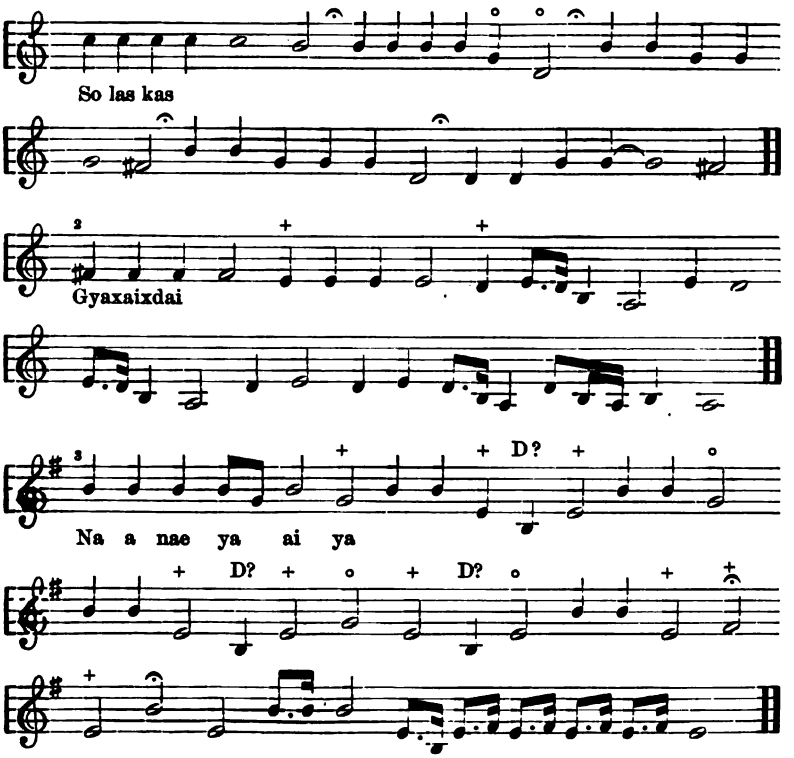
Dr. Boas kindly procured me the opportunity to take down at first hand some of the Vancouver songs. The singers were Mr. George Hunt, the interpreter, and one of the Indians who had taken part in the dances I had already witnessed. At my request, the songs given were very old ones. The Indians were very patient, singing the songs repeatedly and giving us (Dr. Boas was present most of the time) ample opportunity for correction and for making sure that the record was as accurate as it could be made. I say "as accurate as could be made" because the aberrations from pitch were so numerous and often so small in degree as to make it impossible to render them perfectly in our musical notation. In this respect, my experience was parallel to that I had already had among the Omahas; although their music represents a much more advanced stage of music-making than that of the Vancouver Indians.

The songs taken down that day were only three in number and were as follows:

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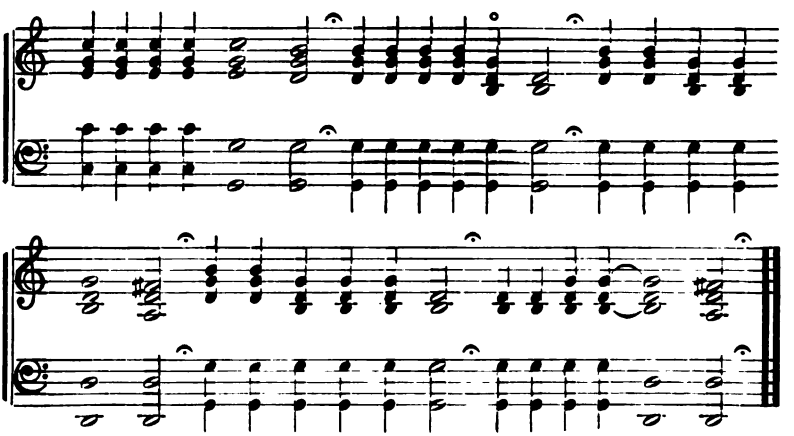
The notation here given represents approximately, at least, the rhythm of the songs; but the singing was accompanied by rapid patting with the hand, the pats being considerably more numerous than the rhythmical units of the songs. Dr. Boas and myself made several attempts to count the pats in each melodic phrase. I found myself unable, in some phrases at least, to count them twice alike. Dr. Boas, who has had long experience with these Indians, felt convinced that there were ten pulses in the song against sixteen beats with the hand. I found myself in doubt, however, and decided to postpone the investigation of this problem until I had solved another, which seemed to me of more pressing importance.

This problem was: Do these melodies, notwithstanding their aberrations from harmonic pitch, really run along harmonic lines or not?

On looking over my notes the next morning, it seemed clear enough that if the Indians really meant to give the first song as I had noted it, the harmonization of it according to the chords implied in the melody was a very simple matter. The first phrase implied two chords: C major and G major; the second phrase embodied the chord of G major pure and simple; so did the fourth phrase; the third and fifth phrases implied the chords of G and D major. Accordingly, I harmonized it thus:

I had already arranged with Dr. Boas to try the effect of the piano version of the songs upon the Indians. Accordingly, we took advantage of the kindness of Mr. G. H. Wilson, who offered us a private room in Music Hall, where we could conduct our experiments

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without fear of interruption. Here we took the interpreter, Mr. Hunt, and another Indian, and I played this song, with and without the chords here given. Dr. Boas at once declared that he should never have suspected it to be the same song the Indians had sung; the Indians themselves also failed to recognize it. They had had no hint as to what song I was to play. I then asked the Indians to sing the song "So las kas," etc., saying that I would play it with them. I played the harmony as they sang, and their faces brightened up immediately. They had recognized the song in its unfamiliar tone quality, and appeared to enjoy the new experience. After repeating this once or twice, I asked the Indians to listen while I played it, and tell me whether I played it exactly as they sang it, or not. They assured me that I did, "as nearly as it could be done," and the most persistent questioning failed to elicit anything but approval from them.

But a surprise was in store for us. It occurred to one of us to ask them to sing it alone, after I had played for them repeatedly and they had approved my harmonized version. They did so, and this time they varied from the version I had noted down by replacing the first G in the third and also in the fourth phrase with an unmistakable F sharp! They did not seem to be aware that they had given a different version from their former one, but persisted in the change, repeating it several times. I then played it with them, substituting the F sharp for G in the melody where they did, but retaining the chord of G, as before, the F sharp being not a harmonic tone, but an accented by-tone. This version they also approved, apparently without being aware of any change, and again assuring us that I played it exactly as they sang it, "as nearly as it could be done." Clearly, it was the harmonic relation of the tones which had the most significance for them; the incidental by-tone was only an embellishment for them, just as it is for us. All this was in consonance with my former experiences, and I had made some hundreds of similar experiments. A song sung by a white man differs greatly in tone quality from the same song sung by another white man or by a white woman, and still more from the same song played on a piano, a violin, a flute, a clarionet, or an oboe. The Indian quality of voice differs greatly from either. Besides this, the Indian rarely sings as true to pitch as do white singers, and is accustomed to having his songs obscured by a vociferous drum-beat and by other noises. I have often found it difficult to recognize an Indian song, which I knew by heart, when I heard Indians sing it in their native habitat and with the usual accom-

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paniments. This was not because the song was not the same. What makes a song a song is its *tonality, i. e., the relation of its successive tones to its key-note.* This is the *essence* of music; all variations of tone-quality, wavering intonation, etc., being merely accidents or incidents. But these incidental peculiarities of Indian singing are so prominent and striking that it is no wonder that they fail to recognize their songs at first when played on a piano. But as soon as they do see that the essential features of the song remain unchanged, they are invariably delighted with them, especially when they are played with their natural harmonies.

It was noteworthy that, whenever they sang with the piano, accompanied by the harmony, they invariably sang true to pitch; while in their unaccompanied singing the pitch was more or less wavering and uncertain. All this, taken together with my former experience with Indians, seemed to me clearly to indicate that a latent sense of harmony was the determining factor in the shaping of their melodies; that their aberrations from harmonic pitch were due not to intention, but to a lack of training and the absence of any standard of harmonic intervals. As soon as the natural harmony was given with as near an approximation to correctness as our tempered tuning would allow, they instantly accepted it as valid, conformed their own singing to it, and seemed to take pleasure in it.

A single doubt remained in the mind of Dr. Boas. The Indians, when singing alone, invariably struck the G of the second phrase below pitch. Why should they do this? If G was really intended, why should they not hit it, at least sometimes? If the failure to sing it true to pitch was due to lack of ear-training, why should they not sometimes sing above it in feeling about for it, instead of invariably striking a quarter tone or thereabouts below? In order to test whether they were really trying to sing F sharp as a harmonic tone, I played it, giving that phrase the chord of B minor; but this did not suit the Indians at all, they would have none of it; whereas, when I played the G major chord, they were always satisfied. I could not help thinking that they really meant to sing G; but I could no more account for their striking it so persistently below pitch than could Dr. Boas. So we separated with a promise to consider the matter further.

Dr. Boas was fortunate enough to solve the problem perfectly before he had left the Exposition grounds. As he walked back with the two Indians, Hunt, the interpreter, who had listened to our discussion, sang this phrase to himself, evidently trying to find out what

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it was that he sang, making, perhaps, his first attempt at analyzing his own singing. Soon he informed Dr. Boas that what he did in that doubtful spot was to strike below the G and slide up to it, just as he had done in the third and fourth phrases, the only difference being that the by-tone in those two phrases was longer and more emphatic. In fact, the by-tone in the place which had puzzled us was so extremely short that neither it nor the G, to which it was meant to lead, was made distinct, the result being a compromise tone varying from a quarter of a tone to something like a comma below harmonic pitch. This was a most unexpected discovery, but an extremely satisfactory one. It settled the point clearly enough that the melodic structure of that phrase was built on the lines of a major chord. And it was especially suggestive to me, as I had never before thought of this simple explanation as one of the many ways of accounting for the numerous aberrations from harmonic pitch which characterize most Indian singing.

So far as this particular song is concerned, I think we are all agreed that it runs on harmonic lines. It does not, indeed, show any well developed sense of harmony or of tonality. The chord which predominates in it is the chord of G major, and it implies the two chords related to G as under-fifth and over-fifth (C major and D major), *i. e.*, the subdominant and dominant chords. But it neither begins nor ends on the tonic; it begins with the subdominant and ends with the dominant chord. But it seems all the more remarkable that, when the sense of harmony and of tonality is so plainly elementary, the form of the melody should be determined, unconsciously to the Indians themselves, by harmonic considerations.

After giving so detailed an account of our work over this first song, I need not dwell on the other two. It is enough to say that the results obtained were similar and went to confirm the views suggested by our study of the first one. No. 2 is plainly in the key of D major, and every phrase of it implies harmony as clearly as does any civilized music. It is built on the tonic, dominant and subdominant chords; its tonality is much more strongly marked than that of No. 1; and it ends with the plagal cadence which I have so often found in the Omaha music and elsewhere. No. 3 is just as clearly in the key of E minor. It certainly implies the tonic and dominant chords, and the cadence is best made with the subdominant before the tonic, *i. e.*, a plagal cadence. Although this chord is not *necessarily* implied in the melody, it makes the close more natural, and is most satisfactory alike

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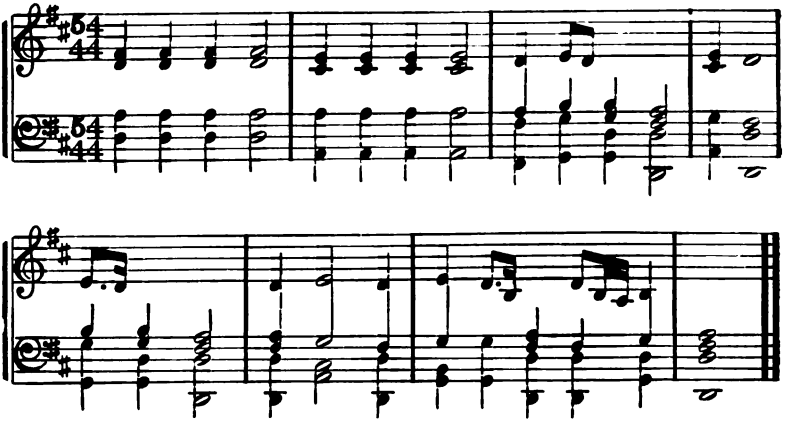
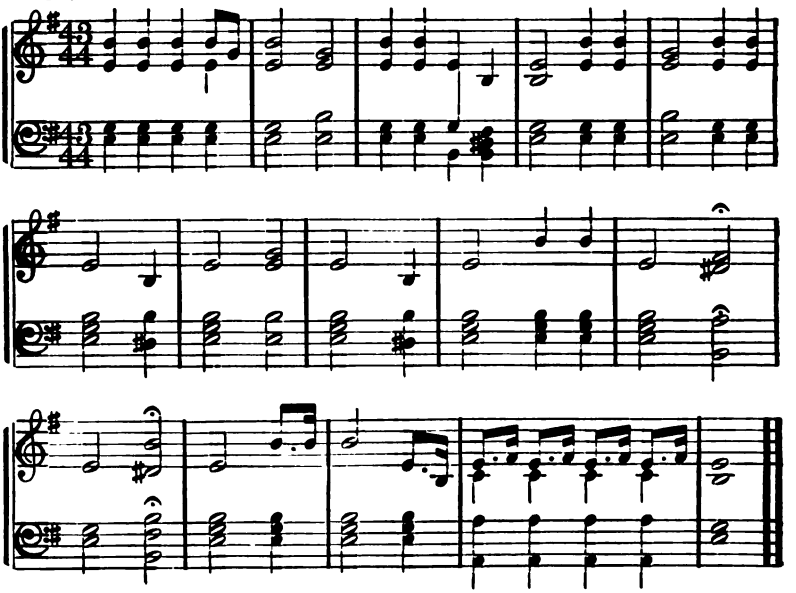
to civilized and uncivilized ears. All this is directly in the line of my previous investigations in the Omaha music, and tends to confirm the conclusions toward which those investigations seemed clearly to point.

No. 2.

No. 3.

The most important of these conclusions is the one already suggested, *viz.*: that the forms assumed by primitive songs are deter-

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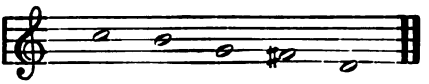
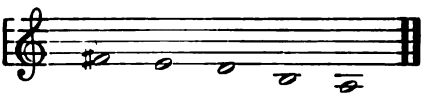
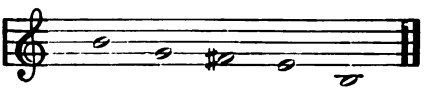
mined, unconsciously to those who make them, by a latent sense of harmony. That, consequently, the question of the *scale* on which any given song is built is a wholly subordinate matter and really resolves itself into the question of *what is the natural harmony* implied or embodied in the song.

Let us, for a moment, consider what scales we can find in these three songs, divesting ourselves for the time being of all ideas as to the harmonic relations of the tones. We shall find that the first song contains the following tones, which I have arranged in consecutive order, from the highest to the lowest:



No. 2 contains the following tones:

The tones in No. 3 are as follows:



Of these, No. 2 is simply the five-toned major scale which is the common property of all primitive races, so far as I have been able to discover. It is the major diatonic scale with the fourth and seventh omitted. No. 3 is the scale of E minor with the fourth, sixth and seventh omitted. No. 1 is the scale of G major with only the sixth omitted.

Assuming that all these pitches were given correctly by the Indians, our problem would be to account for these various omissions. But if we were to take into account, as we must, the numerous and capricious aberrations from scale pitch, our problem would become hopelessly complicated. In No. 3, for example, the tones which I have marked with a cross were seldom sung twice alike. Sometimes they were sung on the pitch I have noted, sometimes a full half-tone above that pitch, and at various intervals between these two extremes. Those I have marked with a zero were sung below pitch; while two tones were sometimes sung nearly a minor third above the pitch here given. Are we to attach melodic significance to these aberrations

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from scale pitch? If so, how shall we account for their incessant variableness? And how shall we account for the further fact that, when the true pitch was given on the piano, especially with the accompaniment of the natural chords, the Indians invariably sang them true to pitch, expressed satisfaction and declared them correct?

The truth is that if we think of these songs from the standpoint of scale exclusively, we involve ourselves in a maze from which it is apparently impossible to extricate ourselves; whereas, if we think of them as derived from chords, the sense of which is a native endowment of the human mind, but which are imperfectly apprehended by the primitive man from lack of experience and education, the whole structure becomes at once perfectly clear and intelligible. The hypothesis of a latent sense of harmony guiding primitive music-making and determining the form of primitive melodies, is a clue the value and certainty of which appear to me more and more clear the further I go in the study of primitive music. Is it, then, an unscientific proceeding to accept this theory, at least as a working hypothesis? If this explains every one of the facts thus far brought to light (and these facts are by no means narrow in range), and no other comprehensible explanation is offered, are we not justified in accepting it as extremely probable, if not absolutely certain? Do we ever reach absolute certainty by the process of induction, or indeed anywhere except in pure mathematics? Besides this, we are to take into account the fact that the human voice, the first musical instrument employed by man, is subject to the physical laws of acoustics; that every tone a man sings is complex and involves the major chord, and that primitive man necessarily hears this chord in every tone sung, although he does not know what it is. Is it so surprising, then, that his singing should run along the lines of the major chord or of its nearest correlative, the minor chord? Whatever may be the explanation of the fact, it is certainly true that in all primitive music I have yet heard harmonic tones predominate, and by-tones are as easily accepted as temporary substitutes for harmonic tones and as leaders to them by the savage as by the civilized ear. But it is rather curious that as a rule by-tones are chosen which belong to the chords most nearly related to the tonic. Then these tones are used as harmonic, and the chords to which they belong naturally fill out the five-toned to an eight-toned scale.

I continued my studies with the Vancouver Indians for several days, beginning Aug. 25th, during which time I collected the following songs:

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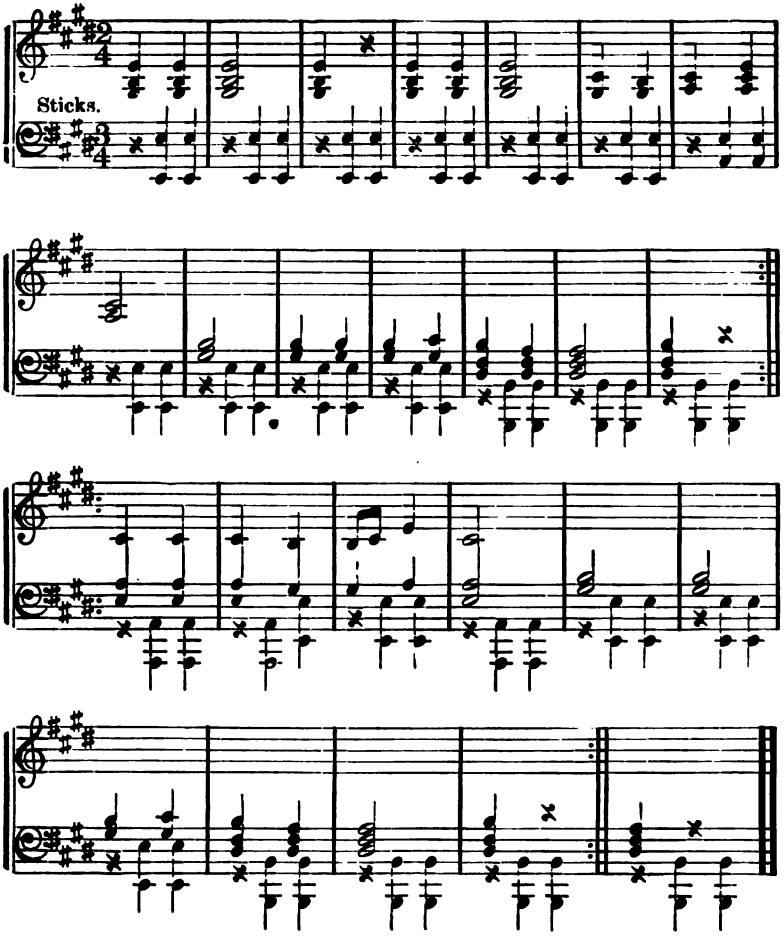
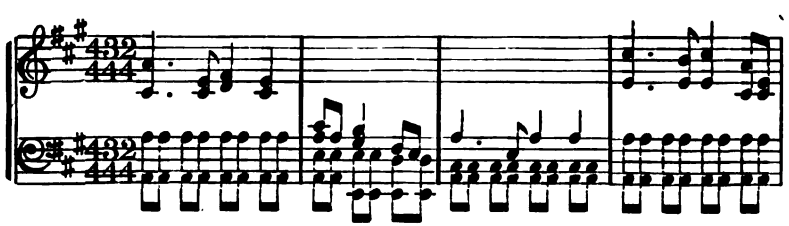
No. 4.

No. 5.

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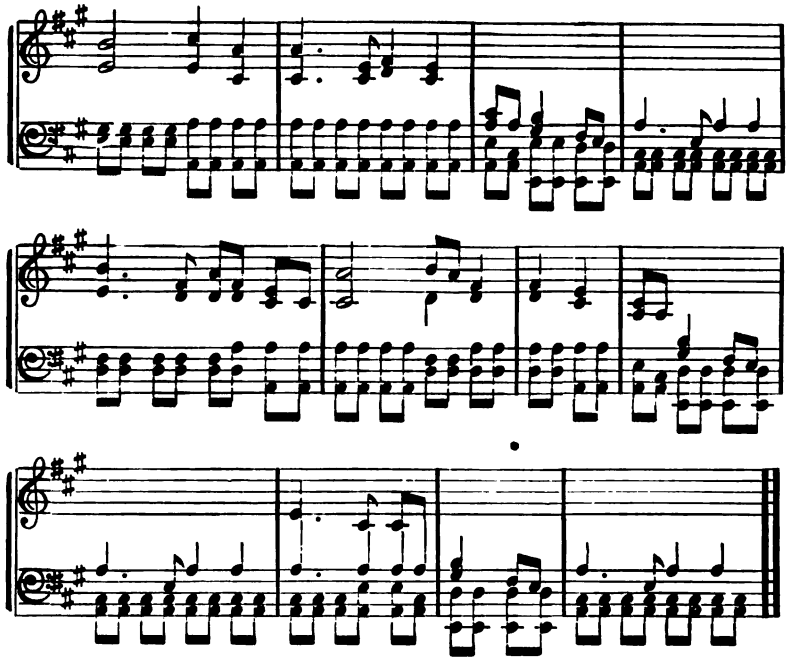
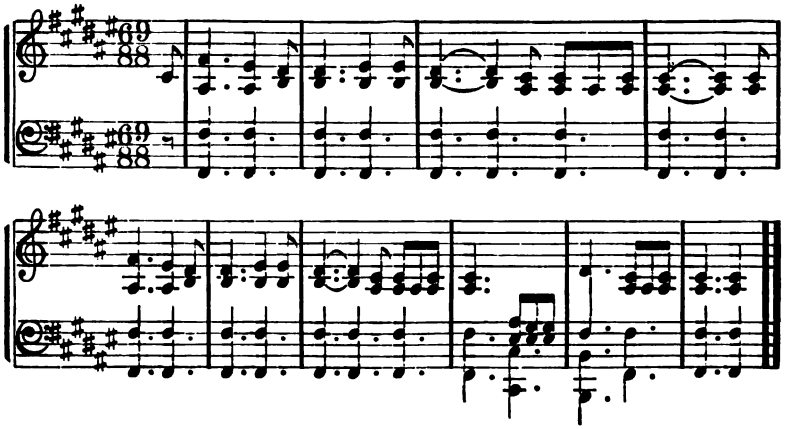

No. 6.

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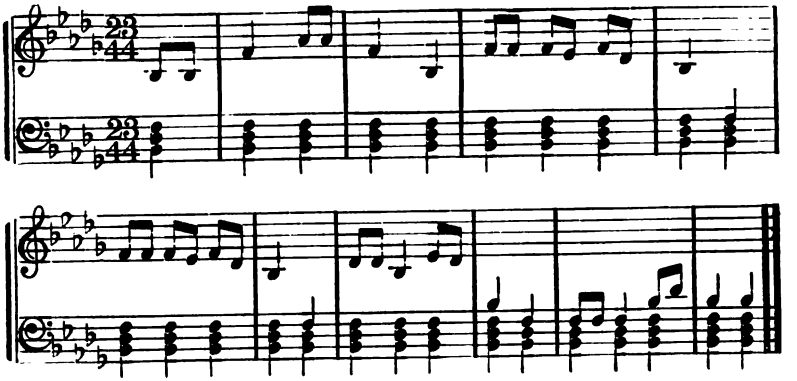
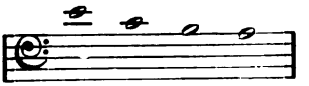
No. 7.

No. 4 is a man-eating song composed by Mr. George Hunt on the same lines as the older cannibal songs and has the scale



The harmony of this and of all these songs has been approved by him after experimenting with different chords. It is curious that he insists on the dominant seventh chord for the close. There are only three chords: tonic, subdominant and dominant (with and without the seventh).

No. 5 has the familiar five-toned scale of the Scotch or Irish melodies. It is a song of the Chomox Indians, at the south end of Vancouver Island. Mr. Hunt told me it was particularly enjoyed by the Indians under his charge, and no wonder, for it is more melodious than the other songs and more smoothly harmonious. It has the same three chords as No. 4.

No. 6 is a song of the Nass River Indians in British Columbia. This tribe lives on tidewater. It has the major scale without the fourth, and the same three chords, employing, however, some sharply dissonant accented by-tones.

No. 7 is a song of the Nass River Indians of the interior, above tidewater. It embodies the tonic chord in B flat minor, using E flat as a by-tone and *adding A flat to the tonic chord* in the first measure. Mr. Hunt insisted on this harmonization and would be satisfied with no other. This adding of a minor seventh to the tonic chord is paralleled by cases in the songs of our American negroes, cited by Mr.

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Krehbiel in his paper at the Folk-lore Congress on the 5th of July, and also in the Dahomey songs. The scale of this song is the five-toned minor. It is noticeable that in Nos. 4 to 7 Mr. Hunt sang true to harmonic pitch, without the usual wavering. He was greatly delighted with the harmonized version of the songs, when played on the piano.

It will be seen that each of these songs embodies a major or minor scale, omitting one or more tones, and omitting sometimes one and sometimes another, on no obvious principles.

The clue to the harmonic principle implied in primitive melody was first afforded me by Miss Alice C. Fletcher. She had long been engaged in studying the songs of the Omaha Indians, and informed me of the very curious and, as I now believe, very significant fact that those Indians, when their songs were played on a piano or organ, were *never satisfied with the mere song, but required the addition of chords.* As our joint study of those songs, with a collection of nearly a hundred of them, is now accessible in the monograph recently published by Harvard University, I will confine myself on this occasion to a few illustrative examples. Here is a song (No. 42 *a* of the Harvard collection) which actually embodies the whole dominant seventh chord in its first phrase, and its remaining phrases are as clearly harmonic as this. Is it a scientific proceeding to ignore this fact? No. 41 is totally unintelligible if looked at merely from the standpoint of scale formation, but is perfectly comprehensible when regarded as the product of harmony and modulation. It begins in the key of B flat major, goes into E flat in the sixth measure, into F in the ninth measure, and ends in C. No. 56 is equally decisive. The A flat in the fourth measure is explainable as a harmonic tone, the under major third of C, and not otherwise. And let it be remembered that all these harmonizations have been repeatedly submitted to Indian criticism and have been heartily approved, over and over again.

But these examples must suffice, for this paper is becoming unconscionably long. I will merely add that my study of the music of the South Sea Islanders, the Dahomeyans, the Javanese and the Chinese, so far as it has gone, confirms the conclusions reached in my study of the Omaha music and of the Vancouver songs. It is all plainly harmonic in character.

The conclusions I have reached may be briefly summed up as follows:

1. *Scale* is a wholly subordinate matter.

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2. The central thing in *tonality*, which is absolutely indispensable to unity in any music, however primitive, is not *scale*, but *tonic chord*, major or minor.

3. The five-toned major and minor scales, which are found all over the world, among races the most diverse in blood, in customs and in habitat, invariably embody the tonic chord, with one tone each of the two fifth-related chords, the dominant and the subdominant.

4. There is no primitive music without tonality, and this tonality is determined by the tonic chord.

5. The five-toned scale, whether major or minor, is developed into the common eight-toned diatonic scale by the process of filling out the dominant and subdominant chords.

6. Chromatic and other aberrations from the diatonic scale are usually to be accounted for on harmonic grounds· but they are sometimes by-tones arising from various causes.

7. Wavering, uncertain intonation, among primitive as among civilized men, is generally due to defective ear or to imperfect musical training; but is sometimes occasioned by excess of emphasis in emotional expression and sometimes by the blending of a by-tone with its principal, as in the case of the Vancouver song already cited.

8. The sense of a tonic chord and of its nearest related chords, however dim and uncertain it may be, is universal.

9. The spontaneous efforts to express emotion in ones, which result in folk-music, always follow the line of least resistance; and that line is a *harmonic* line.

II. RHYTHMS.

Rhythms are, for the most part, either twos or threes, or simple multiples of twos or threes. Primitive music, so far as I have yet studied it, follows this general rule in the main, but shows numerous and frequent departures from it in the directions of irregularity and complexity. The simplest irregularity of rhythm I have yet found is where an occasional measure of one or the other of the two fundamental rhythms is interpolated in a song built on the opposite one. Thus, for example, the beautiful Mekasee song, No. 59 of the Harvard collection, which is in 2-4 time, has a single measure of three beats in the second part. This song also affords an admirable example of syncopation, *i. e.*, the crossing of the regular meter by the rhythmical grouping of the melodic motives. Thus the first and each succeeding phrase of the song begins on the second half of the metri-

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cal pulse and is prolonged to the middle of the next beat. Both the mixing of twos and threes and the syncopation are extremely frequent in the Omaha music, as any one may see by examining it; indeed, Omaha songs which do not exemplify one or the other are exceptional.

Besides the mixing of twos and threes in the manner above described, it is very common for the Omahas to combine a double and triple rhythm simultaneously. A majority of the songs of the Haethuska society have a double drum-beat against a triple rhythm in the song. As the song is almost always more or less syncopated, the result is a complication of rhythms such as would puzzle any but a thoroughly trained musician of our own race. Nos. 17 and 21 of the Harvard collection are examples.

But the Omahas do not confine themselves to the double and triple rhythms, either simple or compound, separate or combined. There are frequent examples of fives combined with fours, as in No. 41. No. 74 is a very curious example of fives followed by threes, further complicated by syncopation. It begins with five drum-beats, the song beginning a half-pulse before the drum-beat and grouping itself in two short phrases of five half-beats each. The remainder of the song is in plain 6-8 rhythm.

It will be seen that this Omaha music represents or rather embodies a rich variety and complexity of rhythm. In both these respects, indeed, it excels most of our civilized music by a great deal. Our most elaborate compositions for orchestra have no rhythms more difficult or more complex than have these short songs; and our popular music is incomparably simpler in rhythm than is the popular music of the Omahas. All this rich variety and complexity, too, is reached without the aid of any theory of rhythm; it is all free and spontaneous. Indians will beat two and sing three in a measure for any length of time with the most perfect ease and freedom.

But the complicated rhythms of which I have spoken are not confined to tribes as far advanced as are the Omahas. The cannibal song of the Vancouver Indians has also a two against a three; but it differs from the same rhythm among the Omahas in that it has a double rhythm in the song against a triple drum-beat; and further, the triple rhythm of the drum has two beats and a rest. The single drum was accompanied by striking sticks on planks, done by all the singers. Here, then, is a phenomenon not easy to account for. This Vancouver music plainly belongs to a lower grade of development melodically

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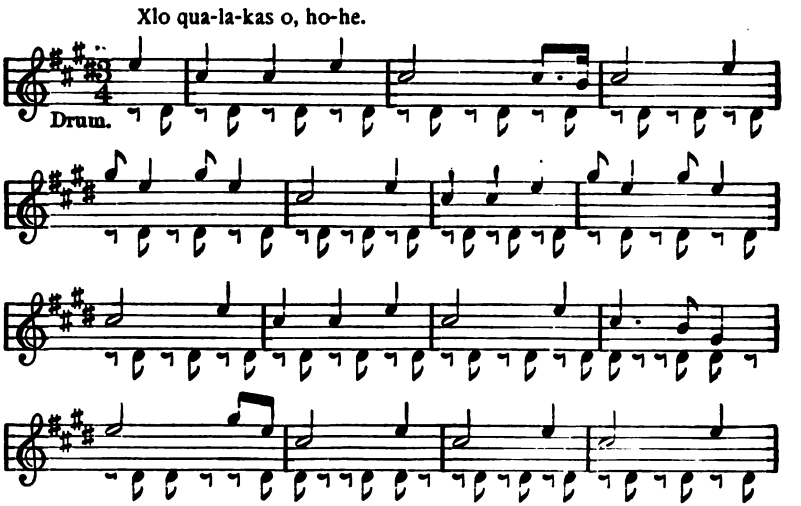
than does that of the Omahas, but the rhythm is even more difficult. For it is much easier to comprehend how the Omahas reached their double drum-beat with its simple rebound when they were singing a song with a triple rhythm, than how the Vancouver Indians came to beat a triple rhythm on a plank, and even interspersed beats with rests, when they were singing a song with a pronounced double rhythm. I have already referred to the exceedingly difficult rhythm of the Vancouver song (No. 1) referred to in the first part of this paper. I have two or three times succeeded in beating this accurately with Mr. Hunt, and made out two beats against each unit of the song. At other times I became confused, as did Dr. Boas, and neither he nor I can as yet account for the difficulty.

The following song (No. 8) was borrowed by the Vancouver Indians from the Bala Balas, a tribe about half way between Vancouver and Alaska. The first part of it is mainly beaten in plain syncopations, with an interruption beginning with the eleventh full measure. The second part, however, has a drum-beat of five counts to the measure, the second and fifth being rests, against a plain 2-4 in the song. This I found a most perplexing and difficult rhythm to transcribe, and Mr. Hunt told me that the Indians themselves had a great deal of trouble with it:

BALA BALA INDIAN SONG.

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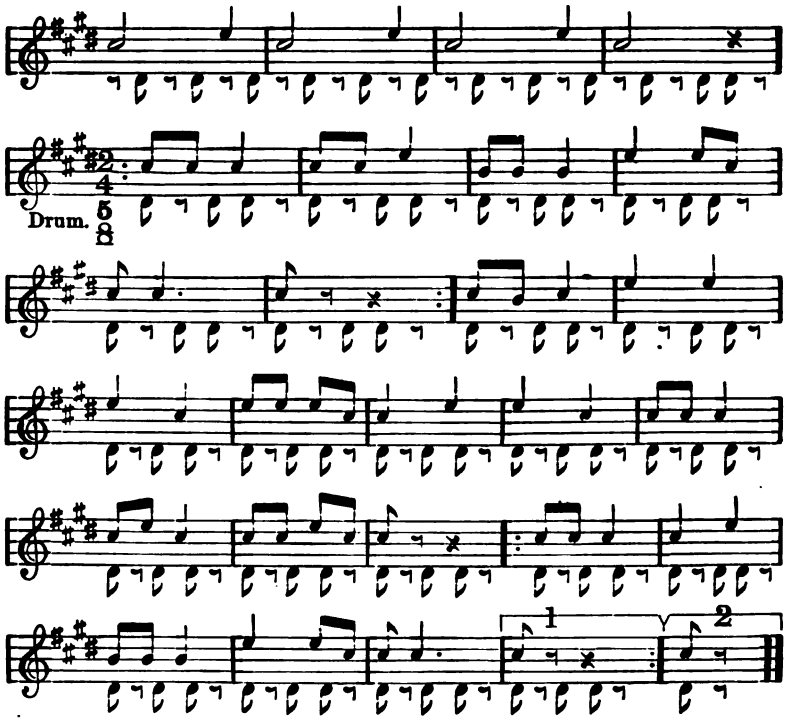
The Vancouver songs show the same mixing of rhythms as the Omaha songs. The natural phrasing of No. 5 would group the units (quarter-notes) into measures of four, three and two. No. 6 I have noted as 6-8 and 9-8; *i. e.*, the measures have some two and some three dotted quarters. No. 5 has fives and fours. The rhythms of the South Sea Islanders and at the Javanese theater are comparatively simple. The most complicated rhythms it has been my fortune to hear are those of the orchestra at the Dahomey village. This orchestra contained seven drums of different sizes, five bells and a pair of rattles. I have heard there one bell beating in triple time, another beating four equal tones against the three of the first one, the rattles four, the big drums six, but divided into two threes, not three twos, while the other drums and bells syncopated against them. It seemed evident, also, that many of these complications were improvised. I watched them for hours, and often fixed my attention for awhile on a single player. The man with the rattles, for example, would be beating a straight two against the three of the big drum and would keep

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on rather listlessly for some time; then he would liven up of a sudden and indulge in some complicated syncopations, when he would settle back into a steady two again. On such occasions he would look around at me as I perched on the rail, note-book in hand, and wink and grin, or perhaps guffaw. Others played similar pranks.

All this would seem to indicate that rhythm is the first æsthetic element to be developed in the evolution of music. It is natural that it should be so. The rhythm of the dance, of the war-drum, even the rhythmic swaying of the mother's body as she croons to her child, naturally precede the development of any fine perception of differences in pitch, of tone-quality, or of tonality. Hence it is not surprising that rhythm should not only be sooner evolved than any other musical element, but also that it should be developed to a high pitch of complexity, and be much more sharply and clearly defined than pitch or quality of tone. It seems to be the one æsthetic element which gives most pleasure to the untaught aborigine; the remaining ones are developed much more slowly, and are much less clearly defined, mainly owing, I think, to the absence of any well defined standards of pitch or tone-quality. In the melodies, as distinguished from the complicated rhythms of the drum-beats, the striking characteristic is the *motivization*, the rhythmic type of the phrases which constitute the models out of which each song is constructed. For almost all, if not all, Indian songs are as strictly developed out of modified repetitions of a motive as are the movements of a Mozart or a Beethoven symphony. Having invented his original motive, which is commonly striking in its rhythmic form and highly characteristic, the Indian composer proceeds to build his song out of modified repetitions of this motive with an instinctive regard for the æsthetic requirements of unity, variety, symmetry, contrast and climax, especially the first three, which have often excited my admiration and have made the study of Indian songs a most delightful and fascinating occupation. Plainly enough, these requirements are founded in the nature of things; and what philosophers have formulated after many centuries of intellectual culture the aboriginal composer discovers intuitively for himself, and, without formulating any rules in words, follows them as obediently as if he had been educated in the most advanced of our great music schools. Thus the study of primitive music opens to us a most attractive vista into a realm of mental activity as yet comparatively unexplored, and one which promises to be fruitful in results, especially in its bearing on the evolution of the æsthetic sense.

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SECRET SOCIETIES AND SACRED MYSTERIES.

BY STEPHEN D. PEET.

THE person who first made known the mysteries of the so-called "medicine lodge" was the celebrated painter George Catlin. He visited the Mandans in 1832, and was permitted to witness the religious ceremony called *okeepa*. He painted the scene in four pictures. They were the first pictorial representations ever made of the esoteric work of an Indian medicine lodge. They were his glory, but proved his misfortune. His description was discredited, and doubts were cast upon all his work as a painter. These interfered with the sale of his gallery in France, and even in the United States. Prince Maximilian of Weid, a year after Catlin's visits, spent a winter among the Mandans and obtained a view of the ceremonies, which confirmed his account of them. The object of this ceremony, according to Catlin, was threefold: First, the celebration of the event of the "settling of the waters;" second, the observance of the dance which would insure to them the coming of buffaloes, which would supply them with food; third, the conducting of the young men of the tribe through an ordeal of torture, by which they were initiated into the position of warriors. This latter part of the scene was revolting, for it was attended with great suffering, but it showed the endurance of the young men. The following is Catlin's description of the medicine lodge:

"Around the walls were hung the shields and bows of the chiefs, and a *mystery thing*, resembling a tortoise or frog, placed on a platform in the center On the floor were four sacks, in the form of large tortoises, which contained water from the four quarters of the world. Besides these there were some drums and buffalo heads. As the ceremony proceeded, there were gathered on the outside of the lodge other symbolic objects. First, the curb or cylinder called the big canoe. Around this were eight men covered with the entire skins of buffalos, horns, hoofs and tails remaining on, their bodies in a horizontal position, while they were looking out of the eyes as through a mask, all of them imitating the actions of the buffalo in a singular pantomime. Each had in his right hand a rattle, a slender staff in his left hand, a lock of buffalo hair around his ankles, a bunch of willow-boughs on his back. Their bodies were painted white, red and black, according to the points of the compass. Eight men, in pairs, surrounded the canoe, to represent the four cardinal points. Between these, alternating with them, were four young men, to represent the

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four quarters of the sky, two of them painted black with white spots, symbolizing the firmament, or night, and the stars; two painted red with white streaks, to represent the day and the ghosts which the morning rays were chasing away. Near the 'big canoe' were two men with skins of grizzly bears thrown over them, who seemed to symbolize the divinities which were to be appeased, as food was offered to them; also two other men, whose bodies were painted black and heads white, who represented bald eagles. They were continually grasping the food that was offered to the bears, but were chased away by a hundred boys with bodies painted yellow and heads white, called antelopes. On the fourth day a strange character appeared among them, his body painted black, with white rings over him, bearing in his hand a long staff with a red ball at the end of it. He personified the evil spirit, the mischief-maker. He was held in check by the medicine man, and was defeated through the virtue of the medicine pipe. The initiation of the warriors, etc., began after this. An inch or more of flesh on each shoulder and breast was taken up between the thumb and finger, and a skewer was forced through, cords were fastened to the skewer, and the body was drawn up by the cords and suspended in the air, the weight of the body drawing upon the muscles. Occasionally the skull of a buffalo was placed upon the arms and legs, increasing the weight. The bodies were then turned faster and faster, until the agony could not be borne longer and the candidate ceased his struggling and hung apparently a lifeless corpse. He was then let down, and the body was dragged, with the buffalo skulls and other weights attached to the flesh, in a circle around the big canoe, until the weights were disengaged by tearing out the flesh. This was called 'the last race.' Each young man was dragged till he fainted, and was left nearly dead, until, by the aid of the great spirit, he was able to rise and stagger through the crowd to his wigwam."

This view of the initiation of warriors, given by the celebrated painter some sixty years ago, reveals to us something of that extensive system of sacred mysteries which is now known to have prevailed among nearly all the aborigines. The view was supplemented at the time by Schoolcraft's descriptions of the Mida songs, and has from time to time received additions from various writers, so that now it is pretty well known that an esoteric system prevailed which may be compared to the sacred mysteries of the East, and which constituted the secret societies of the aborigines.

Among persons who in recent times have awakened popular attention to the subject, and written upon it are the following: Mr. Frank Cushing, who was initiated into the secret societies of the Zunis and in 1883 conducted a party of them through Eastern cities, and finally went down into the waters of the great sea at Nahant and was there baptized and received into the secret organization. After him Dr. Washington Matthews gave to the public a beautiful description of the sacred ceremonies of the Navajos, and of the dry paintings which constituted a part of the ceremonies, and a translation of the

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wonderful mountain chant, with all its imagery and poetry, which seemed like the echoes of the mountains. Captain R. G. Bourke has also published an account of the snake dance among the Moquis and an explanation of its different parts. Mrs. M. C. Stevenson has published two legends of the weird and curious snake drama celebrated by the snake order at Zuni. She has shown that the snake society is a cult organization, of three divisions or orders. She has also described a flute ceremonial which is a dramatization of the migration of the flute people. Miss Alice Fletcher has lived among the Dacotahs and has been permitted to see the most sacred rites and ceremonies of this people. Her descriptions, with those of Rev. J. O. Dorsey, show that there are many secret societies among this people. Dr. Franz Boas has described the customs of the Alaskans and many of the northern tribes, and has shown that there are many societies among them, some of which require that a person should be born into them to be a member. Later than this, Mr. Walter Fewkes has visited the Zunis and witnessed various ceremonies.

The investigation of the sacred mysteries and secret societies of the native tribes is still going on. A large amount of literature has already accumulated; still more is awaiting publication. Enough has been published already for us to dra w a comparison between them and to show what general principles were embodied in them. This we propose to do.

I. Our first question will be: Was there a general organization which spread from tribe to tribe, or did the different societies arise among the tribes separately and distinct? In answering this, we shall go back to the time of the early explorers and examine their testimony.

When Ferdinand De Soto traversed the regions of the Gulf States there was enmity between the Florida tribes and the tribes of Georgia, Alabama and Mississippi, for two or three stocks or families of Indians dwelt there. When Marquette and the French missionaries traversed the regions of the Great Lakes and passed through the portages to the Mississippi River, they found enmity between the various tribes, for the great Algonquin race had crowded down between the Iroquois and the Dacotahs, leaving three stocks or races for these voyagers to traverse. When Coronado passed from the great mountain lake of the Aztecs, in Mexico, and marched with his cavalcade through the arid wastes of Arizona and New Mexico, until he reached the plateaus where were the " seven cities of Cibola," the sedentary tribes and the

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wild tribes were at war. The Moquis and Zunis were obliged to protect themselves from their lurking foe, the Apaches, who had come down upon them from the north. It was not likely that at that time any one organization or select order extended through the entire continent, for the tribes were too widely scattered, and those who were in proximity were too hostile for this. But as time went on and other changes took place, and the old hostilities in a measure ceased, the intruding tribes from the north became adjusted to the new surroundings, and as the ancient tribes became reconciled to their presence, there was a rapid interchange of customs. The different tribes borrowed from one another religious ceremonies and symbols, and especially dancing steps and rites at feasts. It seems probable, then, that the societies and sacred mysteries originated among the separate tribes and that they existed in certain separate centers, and that they embodied in themselves separate and distinct religions, and exhibit customs and myths which were peculiar to the distinct tribes. In fact, the secret societies contain within themselves those signs or tokens by which we may trace out the history, origin and character of the separate tribes. This becomes plain as we enter more minutely into the study of the symbols and the colors and customs of the different societies. Still there is a certain class of symbols which are recognized everywhere and which must have been transmitted from tribe to tribe, or borrowed from a common source. The resemblance of certain symbols to those which are found in all oriental countries makes the latter supposition plausible.

1. There is a class of symbols which could be easily transmitted and which would be very expressive and easily understood, namely, the symbol of the cross, suastika, the serpent, the bird, the circle, crescent, scroll, the hand, the arch, the face, which symbolize respectively the weather, the fire, lightning, thunder, sun, moon, whirlwind, sky, and Manitou.

2. There were certain other symbols, which prevailed in certain art centers or areas, having come from the suggestiveness of nature, but the origin of which is uncertain. Among these we class the turret or stepped figure, which was a Pueblo symbol; the tortoise, or turtle, which was common among the Eastern Indians; the human tree figure, which was known among the Mound-builders and the Mayas; the man eagle, which was also a Mound-builder symbol. These symbols are very common throughout the continent, but are not universally distributed. They were local in their use, if not in their origin.

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3. A third class of symbols might be mentioned, which were purely aboriginal and entirely local in their use. Under this class the conventional figures found in the pictographs or rock inscriptions might be placed. Also those animal figures which were conventionalized by the different tribes, and which had the tribal stamp upon them, illustrations of which are found among the Haidah totems, which are carved, tattooed and woven, and are always recognized as Haidah work.

4. With these symbols the dances may be mentioned. Mr. L. H. Morgan says that dancing was a form of worship among the American aborigines. "Every tribe has from ten to thirty set dances, each with its own name, songs, steps and costume. Particular dances are the special property of a gens or society." Still, he says: "The dances of the Dacotahs, Crees, Ojibwas and Pueblos are the same in general character, steps, plan and music. There is one system throughout the Indian tribes, which bears a direct relation to their system of faith and worship." * There is no doubt that even since the advent of the white man there has been a great mingling of the tribes and interchange of dances, and there is some evidence that there was formerly an interchange between the tribes of the continent and distant races, for in comparing the dances of the Haidahs with those of the South Sea Islanders, at the Exposition grounds, we recognize more resemblance between them than between either of these and the dances of the Pottowotamies and the Eastern Indians.

This review of the symbols and customs of the different tribes will convince us that the secret societies were not the branches of one order, but were different in their origin, and embodied different systems, those of the hunter tribes of the north having embodied the animal worship which prevails among them; those of the agricultural tribes of the south having embodied the sun worship common there; those of the village Indians of the west the sabeanism or sky worship, the symbols being mainly those of the elements. The sacred mysteries among the civilized tribes of the southwest embodied the elaborate system of personified nature powers, under the semblance of anthropomorphic divinities. This is confirmed by the study of the symbols and myths of each tribe, and by comparing them with one another, for by this means we may ascertain what elements were borrowed and what were original with the tribes. The imagery in which

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*See *Ancient Society*, p. 116.

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the myths are clothed will also be very suggestive to us. The records will prove the most valuable.

II. The study of the sacred mysteries of the separate tribes will next engage our attention.

1. Let us begin with the mysteries which are supposed to have prevailed among the tribes of the Gulf States. These were the first to be brought to light, but they are at present the least known. The information which we have is drawn from such travelers as Bartram and Adair, who were hardly aware that there were secret societies. Their descriptions of the customs, when examined in connection with the various symbolic relics which have been preserved from prehistoric times, convince us there were many sacred mysteries and that an elaborate symbolism prevailed.

We learn from them that there were dances, and feasts of which the busk was the chief; that everything was full of symbolism, even the rotunda, council-house, public square, manner of lighting the fire, of receiving and entertaining strangers, the form or manner in which the people were seated, the manner of distributing the black drink in the conch-shells, the manner of smoking the sacred pipe, offering the smoke first to the sun, afterward to the four cardinal points, lastly to the white visitors. The council-house was divided into two apartments. The back apartment was reached by openings, or holes, scarcely large enough for a man to crawl in upon his hands and knees. This secluded place appears to have been designed as a sanctuary, dedicated to religion or priestcraft. The calumet, or pipe of peace, and the imperial standard were kept here. The walls of this building in front were decorated with various paintings and sculptures, supposed to be hieroglyphic, and the pillars supporting the front, were formed in the likeness of vast speckled serpents climbing upwards. The busk, or feast of first fruits, was their principal festival. At this feast all the old worn-out clothes, remaining grain and refuse were consumed by fire. The fire was then extinguished and lighted anew from the central fire.* The rotunda corresponds to the kiva or estufa of the Zunis. It was much more private than the council house; women and youths were never admitted to it. The vigils and vespers and mystical fire in this rotunda were extremely singular. In the center was a great pillar and a spiral circle of fagots, turning from right to left, extending to the distance of ten or twelve feet from the center. The exterior

* See *Bartram's Travels*, pp. 233, 267, 449, 507.

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extremity of the spiral circle takes fire, which slowly creeps around, following the course of the sun, feeding on the fagots till the circle is consumed. The council lasts as long as the fire lasts. We see from this that symbolism prevailed among the southern tribes, namely, the symbolism of nature worship. The yearly festivals and the commemoration of the first fruits were noticed by Bartram. The sacred fire was kept ever burning, as it was in the temple of Vesta, and was a symbol of the national life. There were keepers of the faith among the various tribes, and occasionally vestal virgins resembling those of Rome. The thought that arose with Adair, the Indian agent, was that there was a great resemblance between these feasts and ceremonies and religious customs and those of the Jews. From this arose the theory that the Indians were the "lost tribes," and whole books were written to show the analogies. These analogies consisted (1) in the division into tribes, the names of the clans being drawn from animals, as were those of the tribes of Israel, the totems here being the wild animals, the eagle, wolf, bear, while among the Israelites they were the lion, serpent, hind. (2) The existence of clan elders and the resemblance between the position of these elders and the heads of the houses among the Israelites. (3) It was maintained that the American Indians, especially the Cherokees and Choctaws, had representations of cherubim in their places of worship. (4) The existence of prophets was dwelt upon, and the name prophet was given to some of the orators and leaders, a name which was perpetuated and attached to the great Shawnee prophet in the time of Tecumseh, and to the prophet who was the companion of Black Hawk. (5) It was maintained that the southern Indians carried about an ark, or sacred vessel, which resembled the ark of the Jews.

This analogy between the customs of the Indians and the Israelites has been treated in recent times by scientific men. It was made the subject of an address before the American Association by one of the vice-presidents, Col. Garret Mallory. He maintained that the Jews, after the days of Moses, up to the times of David and the Kings, were in the state of zoolatry or animal worship, similar to that of the southern Indians. They persisted in the worship of animal gods, the golden calf, brazen serpent, the fish god and the fly god. The second commandment was directed against the worship of the demons of earth, air and water. The God of Sinai was a god of storm and lightning. The ancient local god of the Canaanites began, in the exodus, to affect the religious concepts of the Israelites. Along

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with the beast worship the totemism, the special cult of tribes, clans and individuals, was tutelar. They identified Jahveh as the tutelar god of the entire nation. Besides this, the association of a divinity with localities, such as caves, mountains, rocks, trees, the places where remarkable occurrences had been noted, and where dreams and visions had been given, were designated by pillars, exactly as the place of the fasting of individuals was among the Indians, marked by a pile of stones. The pillar of Bethel is compared to the Dacotah stone heaps or piles of buffalo skulls. This is without any foundation whatever, for the Jews in the time of Moses were far in advance of any known American race in all their religious notions and symbols. Recent discoveries show that the art of writing was known long before the exodus, even at the time that Abraham was in Chaldea, four hundred years before. The Egyptologists and Assyriologists show that religious symbolism had gone beyond anything known to the North American Indians. There was no such thing as matriarchy among them, but there was in fact a remarkable system of patriarchy, which was radically distinct from matriarchy. While they were in the tribal state, they had tribal leaders who were the heads of houses and commanders of the army. The division of the territory was according to tribes, but there was property in severalty. There was landed estate very similar to that of the Greeks under Kleisthenes. If the comparison had been drawn between the secret societies of the Indians and some of the sacred mysteries of the Egyptians and Greeks, such as the Eleusinian mysteries, which embodied a type of nature worship, it would have been far more suggestive, for these myths and symbols concerning creation, resurrection, light and darkness and other processes of nature became also the symbols of the progress of the soul-course of life, new birth, spiritual existence and future state. None of these symbols were used by the Jews at the time of the exodus, though they seem to have become a common inheritance among pagan nations. There is more resemblance between these and the myths and symbols which prevailed among some of the native tribes of America, such as the Zunis and Moquis, and the wonder is, how came these analogies to appear among peoples who were so remote from one another in time and place. This is the special inquiry.

Externally, the societies were very different, yet many things were held in common among them.* This we can explain on the

* There was a tribal, or a tribal migrating symbol which differed with

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ground that nature worship was everywhere similar. The same religious conceptions might arise under the same circumstances, the conception of resurrection after death, new birth, the soul separate from the body, restoration of the soul to the body, all appearing in the Zunis, Moquis and other tribes exactly as they existed among the Egyptians. We find no such conceptions among the tribes of the Gulf States, for sun-worship pure and simple prevailed among them. Whatever other symbols they had were the symbols of nature: frogs, symbolizing the water; the serpent, the lightning; the bird, the thunder; the circle, the sun; the square figure, the four quarters of the sky.

2. The sacred mysteries among the Cherokees are as remarkable as those of the tribes of the Gulf States. One advantage in studying these is that there were records kept among them, which have been recently brought to light. The ancient symbols of the tribe were preserved in this way, and sometimes the traditions and myths. Mr. Mooney says that in all tribes that retain anything of their ancient organization we find this sacred knowledge committed to the keeping of the various secret societies, each of which has its peculiar ritual, with regular initiation and degree of advancement.

Another advantage in studying the symbols of the Cherokees is that they were accustomed to build mounds and sites for town houses as memorials of certain ceremonies. In building the mound, a fire was first kindled on the surface; around the fire was placed a circle of stones, on the outside of which were placed the bodies of prominent men, one from each gens. With the bodies was buried a translucent stone, the horn of a horned serpent, a feather from a mythic hawk,

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the different tribes. With the Pawnees and other tribes it was a sacred bundle. With the Choctaws and Chickasaws, the leaning pole was the symbol, but with other tribes, which were wtdely separated,, the shell was the guiding star. It was not always the same shell. The Florida Indians used the conch-shell, one sacred to the sea. The Chippewas of Lake Superior used the cowrie-shell, the Dacotah tribes the clam-shell, about nine inches long. The Cherokees used the terrapin shell. The tradition was that the shell with its iridescent light had led the different tribes throughout their entire history. It became obscured and its light was darkened, but again shone forth, like a star, above the waves, and led the people in their wanderings, as the ark led the Israelites through the wilderness. There may have been other things which were common to the southern tribes and the northern hunter tribes, such as the number four, the thunder bird, the cardinal points, the fire generator, but this one of the shell is as conspicuous as any, for there is no especial significance in the shell.

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a feather from the golden eagle, and beads of seven colors. A hollow cedar log, to serve as a chimney or air-hole, was placed above the fire, the mound built up around it. Upon this the town-house was built. The mouth of the fire-pit was in the middle of the floor of the town-house. The fire was in charge of a firemaker and was never allowed to go out, but was always kept smoldering. A new fire at the annual feast was kindled from this fire-pit. All the fire in the different houses was obtained from the firemaker at the town-house. The roof of the town-house was covered with earth and ran up to a point from the circumference, the eaves coming down almost to the ground outside of the wall. The drummer at the dance or feast walked around this roof in spiral fashion, just as the Aztec priest ascended the great pyramid. Here, then, we have the lodge, or kiva, in which the sacred mysteries were observed, with the symbols of nature worship, described by tradition, and at the same time preserved in an earthwork.

3. The sacred mysteries of the Delawares were as remarkable as those of the Cherokees. There were also records among them. These were kept on sticks six inches in length, tied up in bundles. The custom was not peculiar to the Delawares. The early travelers found them among the southern tribes, and they were familiar to the Iroquois. The Chippewas also used them. They were covered with devices and symbols, which, according to Schoolcraft, were called *kepnewin*, for those in common use, and *keknowin*, for those connected with the mysteries and the Mida worship. The most remarkable record was that contained in the *Walum-Olum* or red-score. The discovery of this was made by Rafinesque, the antiquarian, but published by Dr. D. G. Brinton.* It contains the creation myth and the story of the migration in pictorial language. Of this creation myth Dr. Brinton says: "The general outline is similar to European oriental myths. It was not derived from them, nor acquired by missionary influence, but the similarity is due wholly to the identity of psychological action, the same ideas rising from similar impressions in New as in Old World ideas."

The secret societies of the Delawares have not been described, so that we have to take it for granted that this record was not only a transcription of the creation myth, but embodied in itself the substance of the ceremonies and symbols which were employed in the

* Mr. E. G. Squier read before the New York Historical Society a translation published in the *North American Review* in 1849.

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mysteries. The turtle or tortoise is always a symbol of the earth among the Algonquin tribes. The rabbit or the hare is the symbol of the sun or dawn. The story is that in the beginning there was naught but water and sky, but at length a woman, the common mother, descended from the sky. She alighted on the back of a turtle, which became an island and afterward grew to the main land. This story is found among the Mohawks and Pottowottamies as well as among the Iroquois and Delawares.* Many tribes had vague myths of a journey from beyond the sea. The Shawnees possessed a vague migration myth, that in the remote past they arrived at the main land after crossing the wide water. The legend was repeated annually and a sacrifice offered in memory of the safe arrival. They had a mythical and historical chant which resembled that of the Chippewas. Gallatin says that there were four clans among the Shawnees, named Chillicothe, Piqua, Kiskapocoke and Mequachake. To the last clan was given the office of preserving the sacred records and of conducting the religious ceremonies.†

4. The most complete record of any secret society is the one which is given in the Mida songs of the Chippewas. These Mida songs have been described by Schoolcraft, but have been recently studied anew by Dr. W. J. Hoffman.

Schoolcraft described at considerable length the Mida songs which prevailed among the Ojibwas, and has given the pictographs containing the songs.‡

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* See *Fourth Annual Report of Canadian Institute;* "Dahcotah," by Mrs. Eastman; *Records of a Tourist,* by Charles Lanman.

† *Gallatin's Synopsis,* p. 110.

‡ In these pictographs is the medicine lodge, filled with the presence of the great spirit, who has come down to be present at the ceremonies. A candidate for admission, crowned with feathers, holding an otter-skin pouch, with the wind gushing out of one end. Then a mark for a pause during which the feast is prepared, a man holding a dish in his hand representing the master of the feast. A lodge in which the Mida men are assembled. The arm of the priest or master of ceremonies. The goods offered as a fee of admission. The Mida tree, No. 8, with the root that supplies the medicine. The medicine bag, in the shape of a stuffed crane, which is used in the dance. An arrow in the circle of the sky. The celestial hemisphere, with a symbol of the great spirit, or Manitou, over it. The Wabeno tree, a stick to beat the drum. An Indian walking on the sky. The great spirit filling all space with his beams. A drum, tambourine, raven, crow, medicine lodge, master of the society. The celestial hemisphere.

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The result of personal investigations among the Ojibwas, conducted during the years 1887, 1888 and 1889, shows that Schoolcraft's statements were in the main correct, though the metaphorical coloring was used by him in a manner which now seems absurd, and metaphysical expressions are attached to the symbols which could have never been used by the savages. He says that there are three classes of mystery men, the Wabeno, the Jessakkid and the Mide. The Wabeno are men of the dawn, or eastern men. They give their feasts at night, and sing and dance and are boisterous, and by the use of plants are able to take up red-hot stones and burning brands, and bathe their hands in boiling water, and so are called fire-handlers, or dealers in fire. The Jessakkid is a seer and prophet, or juggler, and called a revealer of hidden truths. The exorcism of demons is the chief pretension. Communion is held with a turtle, and through him with the manitous and the thunder-bird. His incantations are private, in a lodge which sways violently from side to side and is filled with loud thumping noises and numerous voices and laughter, denoting the arrival of the manitou. The Medawin is the grand medicine society. Its origin is buried in obscurity. Mr. Warren says that in the Medawe rite is incorporated most that is ancient among them, and by it are perpetuated the purest and most ancient idioms of their language. It is based upon traditions pertaining to the cosmogony and genesis, and is looked upon by the Indians as containing their religion. This society is graded into four separate and distinct degrees, though one degree is practically only a repetition of the others. The following is the myth on which it was founded:

"Minabozho, the servant of Dzhe Manido, beheld human beings, the ancestors of the Ojibwa. They occupied the four quarters of the earth. He saw how helpless they were and desired to give them the means of warding off the diseases with which they were constantly afflicted, and to provide them with animals and plants to serve as food, and with other comforts. Minabozho remained thoughtfully hovering over the center of the earth, endeavoring to devise some means of communicating with them, when he heard something laugh and perceived a dark object appear on the surface of the water, which, after appearing in the west, and reappearing in the north, east and south, he observed slowly approaching the center of the earth, when he descended and saw that it was the otter, now one of the sacred manitous of the Midewiwin. Then Minabozho instructed the otter in the mysteries of the Midewiwin, and gave him at the same time the sacred rattle to be used at the side of the sick; the sacred Mida drum to be used during the ceremonial of initiation and at sacred feasts, and tobacco, to be employed in invocations and in making peace. The place where Minabozho descended was an island in the middle of a large body of water, and the Mide who is feared above all others is called Minisinoshkwe (He-

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who-lives-on-the-island). Then Minabozho built a Midewigan (sacred Mida lodge) and, taking his drum, he beat upon it and sang a Mida song, telling the otter that Dzhe Manido had decided to help the people, that they might always have life and an abundance of food and other things necessary for their comfort. Minabozho then took the otter into the Midewigan and conferred upon him the secrets of the Midewiwin, and with his Mida bag shot the sacred *migis* into his body, that he might have immortality and be able to confer these secrets to his kinsmen. The *migis* is considered the sacred symbol of the Midewigan, and may consist of any small white shell, though the one believed to be similar to the one mentioned in the above tradition resembles the cowrie."

The following is the explanation of the chart:

"The large circle at the right side of the chart denotes the earth as beheld by Minabozho, while the otter appeared at the square projections at Nos. 1, 2, 3, and 4. The semi-circular appendages between these are the four quarters of the earth, which are inhabited by the Anishinabeg, Nos. 5, 6, 7 and 8. Nos. 9 and 10 represent two of the numerous serpent manitous, who endeavor to prevent entrance into the sacred structure and mysteries of the Midewiwin. The oblong squares Nos. 11 and 12 represent the outline of the first degree of the society, the inner corresponding lines being the course traversed during initiation. The entrance to the lodge is directed toward the east, the western exit indicating the course toward the next higher degree. The four human forms at Nos. 13, 14, 15 and 16 are the four officiating Mida priests. Each is represented as having a rattle. Nos. 17, 18 and 19 indicate the cedar trees, one of each of this species being planted near the outer angles of a Mida lodge. No. 20 represents the ground. The outline of the bear at No. 21 represents the Makwa Manido, or bear spirit, one of the sacred Mida manidos, to which the candidate must pray and make offerings of tobacco, that he may compel the malevolent spirits to draw away from the entrance to the Midewigan, which is shown in No. 28. Nos. 23 and 24 represent the sacred drum which the candidate must use when chanting the prayers. Nos. 30, 31, 32, 33 and 34 are five serpent spirits, evil manidos, who oppose a Mide's progress, though after the feasting and prayers, directed to the Makwa Manido, have by him been deemed sufficient, the four smaller serpent spirits move to either side, and the larger serpent raises its body in the middle, so as to form an arch, beneath which the candidate passes on his way to the second degree. Nos. 35, 36, 46 and 47 are four malignant spirits which guard the entrance to the second degree. Seven Mida priests are represented by Nos. 39, 40, 41, 42, 43, 44 and 45, while the figure 48 shows that supernatural powers are given to the candidate. The lines extending upward from the eyes signify that he can look into futurity; from the ears, that he can hear what is transpiring at a great distance; from the hands, that he can touch, for good or for evil, friends and enemies at a distance, while the lines extending from the feet show that he can traverse all distance and accomplish his desires. The figure No. 53 denotes that the candidate personates the bear seated before his sacred drum. The serpent, No. 54, now arches its body, and beneath it he crawls and advances toward the door, No. 55, the third degree, No. 56, where he encounters four panther spirits, Nos. 57, 58, 59 and 60, who are special guardians of the third-degree lodge. No. 77 signifies his ability

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to grasp from the invisible world, and to accomplish extraordinary deeds. No. 78 personates the bear spirit. He chants prayers, to enter the fourth degree. The chief opponents are the panther spirits, Nos. 80, 82, 83 and 84. Other bad spirits are about the structure: bears, 88; panthers, 91; lynx, 97; human beings, No. 95. In the fourth degree the candidate, No. 98, is endowed with the power of reading thoughts, to call forth the soul. He is covered with the sacred shells. He can practice jugglery. Extending from the fourth degree is an angular pathway, No. 99, showing that his path is beset with dangers. He may possibly deviate from the course of propriety, symbolized by the projecting lines, No. 100. The ovoid figure No. 101 signifies the end of the path, the end of the world, and the end of his existence. Above the fourth degree is the ghost lodge, within which are the spirits of the departed. No. 113 represents the owl passing from the Midewigan to the place of the dead, on the pathway of the dead. No 114. We see in this chart the symbols which preserved the traditions of creation of the world, the course of human life and the safe passage through the intercession of the good spirits in answer to prayers; the serpent lifting itself up and making an arch; the endowment of supernatural gifts; the final end of the world; the departure into the ghost lodge, or the lodge of the spirits. A most remarkable system of natural religion, with many high thoughts—and yet all under the control of the Jessakkids, and subordinate to their jugglery. The conceptions remind us of the sacred mysteries which were prevalent in the east, but the animal symbols and imagery are purely aboriginal."

5. The secret societies of the Iroquois are not so well known. The Iroquois were made up of five different tribes, which were increased to six and seven, the Tuscaroras and the Missesagas having been adopted into the confederacy. This was an arbitrary brotherhood, for the Hurons, which belonged to the same stock, were excluded. The Eries and Neuters were absorbed and lost their individuality. The evidence is, then, that the national organization of the Iroquois was not based upon the ties of kindred, but was based upon an arbitrary and artificial brotherhood which grew out of their system of totemism. The phratries of the different tribes bore the same names, and had the same emblems, and could claim protection and kinship, but could not intermarry. The members of the same tribe could intermarry, but they must belong to different clans and have different totems. They constituted an artificial brotherhood, which had signs and countersigns resembling those of modern secret societies. Mr. Horatio Hale ascribes this to the associative instinct. He says:

"The guilds of the middle ages, the Masonic and other secret brotherhoods; religious and political parties, are all manifestations of the associative instinct, but here the Iroquois founders took advantage of the clan system and made an artificial brotherhood, the tie of which was as strong as that which binds a Free-

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mason of Berlin to a Freemason of New Orleans. This brotherhood came from the original totem system and cannot be ascribed to any known founder, though there was a human founder for the Iroquois confederacy. The confederacy undoubtedly grew out of the preceding system. The chief work of Hiawatha, the law-giver, was mainly to extend the totem system through the five tribes and to make a council-house or a long house, which should combine the council-houses of the clans and tribes into one. The brotherhood then was more of a political organization than religious, though there was an air of religion about it."

Mr. Hale, in a private letter, says that it seems very probable that there were secret societies among the Iroquois, as there were among the other stocks, but they have not been studied. It was a custom among all the wild tribes to make one clan very prominent, and in some cases to consign to the same clan or another the care of all religious affairs. Such was the case with the Shawnees, when they were in Ohio. The Onondagas were chosen by the Iroquois as the tribe to which the long house was committed, they being the most central of all the tribes. The sacred records of the Iroquois have been preserved and have been published under the name of the "Book of Rites." This is not the record of any secret society, but is more like the records which a chief or a monarch would make at the time of his inauguration. It is the record of the ceremonies which took place at the death of a member of the chief council house and the inauguration of a new member. It is called "The Book of the Condoling Council," as it is full of mourning over the death of a chief. It has also been called "The Iroquois Veda." We shall not find in this book any account of sacred mysteries, as we do in the case of the Ojibwa Mida songs, nor do we find in it as elaborate symbolism as we do in Catlin's pictures of the Mandan ceremony. Its style is quiet and subdued and reminds us of the character of that remarkable man, who has been regarded as the culture hero of the Iroquois, Hiawatha.

6. The secret societies of the Dacotahs were more numerous and more marked than those of the Iroquois. Some of these were mere social societies, others were designed for sacred mysteries. We find among the Dacotahs the care of the sacred pipes, sacred songs and tribal records was committed to one particular clan. It was looked upon as sacrilege for others to sing these songs. The keepers of the sacred tents belonged to the "hanga" gens. There were also sacred or mysterious men among the Omahas. These were reverenced by all men. They were governors of the tribe and were counted as gods. There were, however, several dancing societies, called Hecucka. One of these was composed of such as had distinguished themselves in war,

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and boys whose fathers were chiefs. The name of the principal society was Wacicka. It existed under different names in many tribes, the Omahas, Chippewas, and the Dacotahs. They held a dance in the spring of the year. A sacred bag was given to the candidate. None but members could take part in the dance. Four days were spent in the secrets of initiation. The otter-skin bag was the chief symbol. The Icugci dance was conducted by the society of those who have the translucent stones. Small white stones were the symbols. The buffalo dance, wolf dance, the grizzly bear dance, the black bear dance are conducted by the societies of those who have supernatural communication with buffaloes, wolves, grizzly bears, black bears. In these some or all of the dancers wear the skins of these various animals. The ghost dance is conducted by those who have supernatural communication with ghosts. The "hakuna" dance, which was a sort of courting society, was held in a large earth lodge, in the center of which was a fire. These dancing societies were all open societies and were not to be classed with sacred mysteries or secret societies.

Among the Dacotahs the religious affairs were closely associated with civil, were not differentiated. The sacred tent holds the sacred clam shell, the tobacco bag made of the bladder of an elk, the tribal war pipe made of red pipe-stone, the sacred bag made of the skin and feathers of a bird, the war eagle.

The conclusion which we reach is, then, that most of the secret societies and sacred mysteries were a part of the tribal organization and were really the religious houses of the people. The symbolism which was founded upon nature worship was guarded by these societies, and even the history of the tribe, especially that history which, like the history of the Bible, goes back to the creation, was preserved by the sacred men of the tribe. There was a priesthood which dealt with the secrets of nature and the mysteries of the gods. This priesthood at times went into the practice of magic and used the black arts. Still, there was a majesty and august bearing among some of them which impressed the people with the sacredness of the supernatural.

III. The comparison of the sacred mysteries found among the tribes of the great plateau with those among the eastern tribes will prove interesting. There was here an entirely different system of religion, and the religious ceremonies were accordingly very different. These were conducted in underground chambers called "kivas," the most ancient of which were in the shape of a cone, though in later times they became square rooms, resembling the other rooms of the

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Pueblos. There was one peculiarity about these kivas, which reminds us of the custom of the Cherokees. In the middle of the room there was a fire-place, which was hollowed out from the floor and was very sacred, for it was the place where the spirits of the ancestors dwelt, and out of which they came. These were the "divinities of the hearth."

The kiva is spoken of as the home of the organization. It may belong either to a society, a group of gentes, or an individual. No woman could enter the kivas. There was a symbolism about this room. The cavity beneath the floor indicates the place of the beginning, the house under the earth, the abode of the creator, the place from which the people emerged. The lower floor represents the second stage or the second world, for there are four worlds in the genesis myth. The elevated section of the floor denotes the third stage, where animals were created. Animal fetiches were set in groups upon this platform. There was an opening through the kiva hatchway. The people climbed up a ladder through this to the open air. This symbolized the manner of their emerging from the earth in the creation myth. The fourth world was the open air.

A myth which has been preserved by Mrs. Stevenson is as follows:

When the people first came to this world, they passed through four worlds, all in the interior, the passage-way from darkness to light being through a large reed. They were led by two war gods, twin brothers, sons of the sun. They reached this world in the early morning, and, seeing the morning star, they rejoiced and said to the war gods: "We see your father," referring to the sun. "No, this is the warrior who comes before our father," was the reply. Afterward they saw the sun, and were full of fear. The first of the Zunis to arrive were the bear gens, the corn gens, and the sand-hill crane gens. They were preceded by two local divinities, the son and daughter of a priest-doctor, called Kawimosa, who dwelt upon the mountains and were transformed, the one into a hideous-looking creature, and the other into a being with snow-white hair—possibly personifications of the snow and rain, or a white cloud and black cloud. One of these, as he descended the mountain, drew his foot through the sands. Immediately a river flowed and a lake appeared, and in the depths of the lake a group of houses. Across this river the Zunis were obliged to pass in their long journey, before they reached their resting-place. As they crossed, some of the children fell and were drowned, but their spirits went to the beautiful village beneath the lake. There was a belief among the people that there was a passage-way into the depths of the lake, where were the waters of everlasting happiness. In the passage-way were four chambers, where the priests of the divinities rest in their journeys to the sacred waters. This is associated with a mountain and a cave, not many miles from Zuni, which are supposed to be the very places which mark the passage-way from the earth to the spirit

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land. In this cave, plumed sticks were gathered, and an ancient shrine at the mouth of it. There is also a lake about forty-five miles away from Zuni. The spirit lake is the home of the divinities, called the "Sootike" or the "Kokko." The mythical plumed serpent Kolo-oo-witsi has its home in the hot spring, not far from the old village of the Zunis. This plumed serpent figures very conspicuously in the initiatory rites. He is under the control of a great divinity called "Kaklo," the father of the lesser divinities called "Kokko" or "Sootike," who furnishes the food and water and all necessary things ,through the body of the serpent. He has certain servants whom he calls "Salamobiya" and whom he sends to the north, east, west and south, to the heavens and to the earth, to procure the cereals. When these return, he says to the serpent: "You will carry them with water to the Zunis, and tell them what to do with the seeds, but I will go in advance and prepare them for your coming." The servants or messengers then take the plumed serpent Ko-lo-oo-witsi and carry him to the kivas, and he is the chief object in the ceremony, which occurs once in four years.

This is the myth on which is based the ceremony and which explains the different parts of the ceremony. It is a personification myth, for every name in it can be applied to some nature power and can be shown to be a personal name for a familiar object—the sun and moon, stars, rain, snow, clouds, lightning, springs, caves, rivers. The most suggestive is the name of the plumed serpent, which signified the rain-cloud floating over the mountains, occasionally descending into the valleys, bringing water and grain to the villages. The ceremony itself was only a sacred drama which represented the different operations of nature. In the initiation of the children, which takes place in the sacred kivas once in four years, images, masks and plumes are used to symbolize the various divinities, the image of a great serpent being the chief object. The symbols are as follows:

There are six religious houses, one for each of the cardinal points, one for the zenith and one for the nadir. The superstition is that no male child can after death enter the spirit lake, or have access to the sacred houses of the ancient village hidden in its depths, unless he receives the sacred breath of the spiritual divinities, or "Sootike." There are accordingly persons appointed who are endowed with the breath, and these represent the different parts of the sky, and appear in the ceremony. They wear masks—those for the north, yellow; those for the west, blue; those for the south, red; those for the east, white; those for the heavens, all colors; those for the earth, black. These come to the village after sundown. They carry a serpent made of hide, about twelve feet long and eighteen inches through, the abdomen painted white, the back black, covered with white stars. The tail is held by the priest, who constantly blows through a large shell which he carries in his right hand. They pass through the town, visit each kiva, and put the head of the serpent through the hatchway, where it may be seen by those in the kivas. They finally retire to a particular kiva, the walls of which are decorated with the figures of two serpents, and there leave the image. The members of secret orders are assembled and

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continue to dance with the Sootike in the different kivas until the first white streaks warn them that day is approaching. At this time the head of the serpent is seen projecting through an opening in the wall of the kiva, but the image is seen by the uncertain light of the faintest impression of day. Behind the serpent the old priest stands and blows through the body, the peculiar noise representing the roaring of a sea monster. At sunrise the messengers, Salamobija, bring to the priest plumes and ears of corn, colored yellow for the north, blue for the west, red for the south, white for the east, black for the earth, and all colors for the heavens. A sumptuous meal is now served in the kivas, after which the messengers plant their plumes at the respective cardinal points, and drink the medicine water prepared by the priest of the great fire order, take the bunches of Spanish bayonets in their hands and prepare for the ceremony. The priest of the sun enters the sacred plaza and draws the sacred square, with the sacred meal, along the south and the west sides, on which the messengers are to stand—a yellow line on the east, a blue line for the west, a red line for the south. Along these lines the godfathers pass, each one holding his godchild on his back. As he passes the line where the Sootike stand, each one strikes the child with a large bunch of Spanish bayonets, with such force, at times, as to draw tears to the eyes of the little ones. The godfather then receives a plume, which is made of the soft, downy feathers of the eagle, attaches it to the scalplock of the child, and gives it a drink of the holy water, which is dipped from a bowl by the medicine man with a shell. This ceremony is in the open air. The night ceremony is in the kiva. Here the godparents sit upon a stone ledge, which represents the third stage in the creation, each with a boy at his side on the ledge. The father of the sun sits upon a throne at the west end of the room, with two young priests at the right and left; the high priest and priestess of the earth on either side of the throne. The war god sits at the left of the fire altar and feeds the sacred flames. Inside of the kiva are mounds of sand, on which are wands of feathers, which the messengers from all the points of the compass take and carry to the child, blowing the sacred breath over the plumes into the mouth of the child. The messengers of the north, east, south, west, all in turn, go to each child, and as each messenger completes the round, he places his wand in his belt, turns a somerset over the fire, strikes his head on the fire-slab and leaves the kiva feet foremost. After this the feathered serpent appears, borne by the Sootike and the priest. The high priest of the bow, the sky, the priestess of the earth, ascend to the hatchway, holding a large earthen bowl, to catch the water poured from the mouth of the Ko-lo-oo-witsi serpent. Each godfather carries the holy water to the boys to drink, and makes a gift of the bowl to the boy, who sprinkles the corn stacked in his house with it. After the water is exhausted, the priests catch the seeds which are sent from the abdomen of the Ko-lo-oo-witsi, or serpent, in their blankets and distribute the seeds to all present. The boys now return to their homes, but in the morning are taken to the house, and, after a sumptuous breakfast, are taken a distance from the village and plant the prayer plumes and deposit the plumes from the child's head with a prayer, the child repeating the prayers after the godfather. This ends the remarkable initiation of a child in the sacred order of the Sootike. It is in every part symbolic, but symbolic of the nature powers rather than the animal divinities.

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It will be noticed in this ceremony that the serpent is really a benefactor rather than an enemy, showing that he was a personification of the rain-cloud; he is borne by the Sootike, who are messengers of the wind; he also appears at the earliest dawn, and again late in the evening or at night, at the hatchways of the kiva. The personification of the sun sits upon the throne, but the priest of the sky and the priestess of the earth symbolize male and female, "mother earth" and "father sky," exactly as they did among the Egyptians. The gifts of the water and the corn come through the body of the serpent as through the rain-cloud. The arch of the sky is symbolized by the roof of the kiva. The ledge or rock, on which the people live, is symbolized by the ledge on which the godfathers sit, with their relatives at their side. The fire is in the center of the kiva, the plumes planted on the floor of the kiva; the wind gods or messengers turn somersets over the fire, both as they come in from the sky through the hatchway and as they go up. The water descends from the sky and is distributed in bowls to those on the ledge, and the bowl is left as an emblem of water for the household. The whole ceremony is unique. There is no trace of any historic tradition in it. It is purely aboriginal. Not even the trace of a cosmogony or deluge, such as we find among the eastern tribes. The conception of the future is also unique. Heaven is a pueblo beneath the water and not in the sky. The passage to it is through the mountain and not through the clouds. The kiva is the most sacred part of it. The soul of the child can enter this kiva by means of the intercession of the priests and by making prayers to the divinities. Water was the greatest blessing, even more of a blessing than the sky. Thus the contrasts are owing to the surroundings. The Scandinavians located their heavens near the region of fire. The Christian locates his heaven in the sky and in the sunlight. The Zuni located his in the water.

IV. The significance of the ceremonies and symbols will next engage our attention. These were for the most part dramatizations and had relation to the "course of life" and perhaps to the "*journey of the soul.*" This will be seen more fully as we come to study the remarkable myths and symbols of the Navajos.

The secret societies of the Navajos are not so well known as are those of the Zunis and Moquis; still there are various customs and myths which convince us that they were very powerful. The Navajos seem to have been very secret in their ways. They rarely put symbols on the rocks, and the sand painting which was common

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among them was much of it practiced in secret. Even that which was done in public had an esoteric meaning which was equivalent to secrecy. Still the various myths and ceremonies which have been made known convince us that there was a secret order by which these ceremonies were conducted and the myths preserved. The prayer of the Navajo shaman given by Dr. Washington Matthews illustrates this. This prayer might be called the journey of a soul after a body. It is a prayer which must be repeated at one time without cessation, and with great care to observe every part in its order. It contains a series of word pictures, pictures of the unseen world under the material figures. In it the suppliant calls upon the divinities of the four mountains to come to him. There is a place of emergence referring to the story of the emerging of the people from under the earth.

This place is guarded by Smooth Wind, but one of the war gods, Nagaynezni, with a black wand, a slayer of the alien gods, and Tobajischeni, the second of the war gods, a kinsman to the waters, with a blue wand, open the way for him. The passage is now through the chambers or houses of the clouds—the black cloud, the blue cloud, the yellow and the white clouds. The gods with the black wand and the blue wand lead the way. His passage is next through the chambers of the houses of the mists—the black mist, the blue mist, the white mist and the yellow mist. He arrives at the red river's crossing, an imaginary locality in one of the lower worlds. He then approaches the chambers of the mountains. First is the chamber of the black mountain, where the door is guarded by the red bear. Next the chamber of the blue mountain, which is guarded by the red serpent. The third is the yellow mountain, where the red coyote guards the door. The fourth is the chamber of the white mountain, where the red hawk guards the door. He comes to the entry of the red-floored lodge, which is the house of the woman, the chief of the witches. He enters and reaches the edge of the lodge, then the fire-place of the lodge, then the middle of the lodge, and finally the back of the lodge. Here he finds the spiritual body, which is held in the power of the woman chieftain. The feet, limbs, body, mind, dust, saliva, hair, are all recognized. The war god places the stone knife and the talking feather in his hand, turns around as the sun moves, and says: "Woman chieftain, my grandson is restored to me. Seek not to find him; say not a word. We start back with my grandson; he is restored to me." They then go back to the middle of the lodge, to the edge of the lodge, through the entry of the lodge, the war gods, one with his black wand before, the other with his blue wand behind him; back through the chambers of the mountains, past the red hawk, the red coyote, the red serpent and the red bear. They cross the red rivers; they climb up through the white mist, yellow mist, blue mist and black mist; through the white cloud, the yellow cloud; the blue cloud and black cloud; through the place of emergence, along the coyote race-course, past the two hanging gourds, by the brown pinnacle and the breeze under a tree, until he sees his lodge and the trails that lead to it, and the broad field beautified with corn. Here two other divinities, Haschayon

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and Haschayalti, who were peaceful and beneficent gods of the Navajos, appear, one with a white wand and the other with blue, and lead him through the trails and across the fields to the entry of his lodge, made of the daylight. They then pass through the edge of the lodge to the fire-place, to the middle of the lodge and the back of the lodge, where they all sit down on the floor of the lodge, where the feet, limbs, body, mind, dust, saliva, hair, are lying. The shaman exclaims: "I have returned to my feet, my limbs, body, mind, dust, saliva, hair; and my feet are restored to me, my limbs, my body, my mind, are restored to me. The world before me, behind me, below me, above me, all things around me, are restored in beauty. My voice is restored in beauty. It is restored in beauty, in beauty, in beauty, in beauty."

This prayer illustrates the journey of the soul after the spiritual body, or astral body, that it might be restored to the physical body. The same thought is conveyed by the mountain chant. This chant describes the adventures of a Navajo hunter who was taken captive. He wandered among the mountains in his effort to escape and get back to his home. It describes the wonderful adventures, which can be compared only to the journey of Virgil through Tartarus, or Dante and Beatrice through the infernal regions. The rocks open by magic power, and he passes in and out again. Trees rise heaven high and land him on the top of the mountains. Mountains sink and rise again, chambers appear. The wind storms and tornadoes come with rushing noise, the air is filled with logs and uprooted trees, but the tempest recognizes him and subsides. Serpents show signs of great anger, shake their rattles violently, thrust out their tongues, but they do not bite. After passing dangers of this kind they come to the houses, the homes of the lightning gods, where the birds flash lightning from their claws. They come to the house of the butterflies, filled with butterflies and rainbows; also to the house of the squirrels, which is built of black water, with a door of red sunbeams; the house of the porcupine gods, where the door is of wind; a house of rock crystal with a door of all sorts of plants; a house of cherries with a door of lightning; a house made of dew-drops, on leaf mountain, whose door is made of plants of different kinds; to the house of white water, whose door is of daylight. Rainbows ran in every direction and made the house shine with bright colors. They finally came to the medicine lodge, where the ceremonies and dances were conducted by gods, in the shape of the powers of nature, radiating white streaks, beautifully decorated with necklaces made of turquoise, coral and rare shells, embroidered dresses and many beautiful things. The poetry contained in this mountain chant is most remarkable, and equals in some respects the poetry of Dante himself. The imagery is drawn from the

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mountain scenery, is filled with bright colors and contains pictures of all the wild things of nature, strangely blended with thoughts of the supernatural beings.

This wonderful chant is symbolized by the sand paintings which form an important part in one of the secret ceremonies of the Navajos. These paintings contain figures of the cross, and the rainbow, with various plants and animals, all of them in colors; but the chief figures are the serpents which form the walls of the chambers and guard the rafts of the clouds, very much as the serpents guard the halls or lodges in the Medawin ceremony. The imagery is different, for the houses or chambers are in the sky, and the divinities are sky divinities. The serpents are symbols of the nature powers. The cross is the weather symbol. The rainbow is the symbol of the arch of the sky. The revolution of the cross is a symbol of the revolution of the earth. The bowl in the center is the symbol of the water. It is an imagery adapted to the cult of the sky rather than to the animal cult, but it reveals the same general conception, the personification of the powers of nature.

One of these ceremonies has been described by Mr. James Stevenson. In this ceremony four men were prepared to personate gods and goddesses. The lodge had the rainbow painted over it. The doorway to the lodge was made of buckskins, which represented the daylight, or the twilight which comes just at the dawn of day. A sand painting, which represents the rainbow, was drawn inside of the medicine lodge, but was erased the first day, and the lodge was taken down and laid at the four points of the compass. Ceremonies in which the four plumes, medicine tubes, reeds, beads, crystals heralding the sunbeam, corn pollen, bunches of feathers, were brought into the lodge and placed on a rug. Various ceremonies were passed through with great care to observe every point correctly. A chant was sung by the song priests. The personators of the gods adorned themselves with silver belts, and wore masks and waved pine boughs.

In another painting there is a cross in the center of the lodge, which symbolizes water and sunbeams. On the arms of the cross are the gods and goddesses painted in colors, the heads ornamented with eagle plumes, a line of sunlight on the head, blue sunlight on the skirts, colored stars upon the bodies. They carry rattles in their hands to symbolize the rain. The staff is colored black and ornamented with eagle plumes and sunbeams, symbolizing the clouds and sunlight and the powers of nature.

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OBSERVATIONS AMONG THE CAMEROON TRIBES OF WEST CENTRAL AFRICA.

BY C. H. RICHARDSON.

THE continent of Africa is prolific with signs of ancient historical relations. The student of ethnology will find a rich field of research, and the scientist will find increasing interest and surprising discoveries. The piercing sun and fatal climate of this unfortunate country have alone held back the foot of the explorer and arrested the pen of the historian. But difficulties vanish before time, and the result of past research into the condition of this country has been so fruitful of interesting information that every succeeding year will be accompanied with new encouragement and will carry an impetus to future endeavor, which will, we trust, bring to light what is yet a mystery in the history of the Dark Continent.

The country of the Cameroons is situated on the west coast of Africa, between parallels of 5° N. and 10° S. latitude. The coast is for the most part low and marshy. There are few rugged coast lines. But a uniform climate prevails and it is unhealthy. But as you enter the interior the country rises at the rate of 75 feet to the 100 miles. All of Western Africa is heavily timbered, and large trees of ebony and mahogany abound. For ten years it was our privilege to reside at Bakundu, 110 miles interior of the Cameroons Mountains. We lived four miles distant from the Cameroons River, at a point 5° N. Lat. and 10° W. Long. Here we found it more healthy than it was at the coast or on the banks of the river. After a year of fevers we had here very good health. All Europeans must have this fever. It is the process of acclimatization, a reduction of the system and regulation of the blood to African normal conditions. All newcomers must imbibe good supplies of quinine. Quinine is an antiperiodic, a preventive, not a cure of the fever. We had the quinine put upon the breakfast table, so that we would not forget to take a morning dose of the requisite. We found small doses taken always more effective and less injurious than large doses taken only when fever of a malignant type had been contracted. Even when one is acclimatized, he is yet subject to occasional fever, caused by exposure

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and fatigue, and commonly called accidental fever. It is no more dangerous, however, than a slight cold in a northern clime, if due attention is paid to it and relief administered.

All Africans, when young, have an hereditary disease called *bebatti*—coequal in appearance to scarlet fever, but not contagious. They bathe the infant every morning in the waters of the clear, cold brook. The pimples on the body of the infant emit a mucid liquid called by the natives *madiba ya bubi*, or evil water, and none of them escape this disease, and it is undoubtedly their climatic change and accounts for their immunity from that fatal type of the African fever which thins the ranks of the adventurous merchant and explorer. I believe that if this mucid substance was inoculated into the blood of a European it would render him impervious to fatal fever. Of course, I did not try it on myself, and my wife objected to be the subject of the first application. So I commend it to men of science everywhere as a solution of one of the most important of African problems. This might make the use of horses possible in West Central African commerce as a substitute for the slow foot and hand of the native carrier. The question of roads would then be one of necessity, and the jungle-path would give way to a wide highway, by which the rich woods and oils of the interior would reach the markets of the world.

There are two seasons in Africa—a wet season and a dry one. Each is ushered in by tornadoes, the cause of which I have no need to discuss scientifically to this audience. These tornadoes often blow down the houses and bananas of the people, and they believe that the witch sends them. Once I attempted to give them a scientific explanation, but as I found that they were incredulous and doubted my story, I desisted, for fear that my reputation for veracity might be impaired for future use. I had occasion to tell them the world was round. "I do not believe that," said one, "for the houses would all fall off." So I learned to wait until they were more advanced before venturing upon the scientific.

"All the world and every creature" might be a short expression of the sentiment of this World's Ethnological Congress. The students of antiquity may find as much of interest to excavate from the minds of the African negro of the continent of Africa as those find who work in the excavations of Pompeii. Habits and customs of peoples are as true a sign of ancient historical connections as the hieroglyphics unearthed from the sacred soil of the Pharaohs. Rolling rocks and tottering temples mark the spots where ancient cities stood, and there

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stand in the chaotic character of the African people marks of by-gone pomp and ancient splendor. Nature is true to the death everywhere, and the African barbarian boasts himself of lofty birth and noble ancestry. Physiology and psychology will find phenomenal and surprising departures from the common rule. Men of brains are standing among the forest of population like giant oaks, only bound by the limits of requirements and the limited area of their knowledge.

There are men of genius who have the unwritten laws of the people engraved on their memory, though they have no law report to which to resort. Their minds are a store-house of past precedent in all civil and criminal cases. Some of these lawyers speak five languages and go miles to settle grave causes among adjoining tribes. Wit and humor sparkle like gems and precious stones in the mines of Kimberly. Every branch of professional life is represented, the physician and surgeon as well as the merchant and silversmith.

All of these display past civilization in crude form, but none show what the African mind is so well as the native lawyer or spokesman of the people. They hold courts of three characters—civil, criminal, and custom or ecclesiastical.

Their civil courts relate to breaches of contracts in trades for wives or goods.

Their criminal courts have jurisdiction of violations of marriage rights and theft and unnatural deaths, said to be caused by poison or witchcraft, or accidental murder, or careless homicide.

Witnesses swear upon an idol image called *mosongos*,and it is claimed that any one swearing falsely upon the head of the image will be visited with summary punishment from the violated image.

Various bunches of sticks may be seen over any front door of a chief of a household. When a trade is made and partial payment accepted, a stick four or five inches long is taken and notches cut into it to represent the quantities of what is proffered in payment. The stick is then cut or split in two pieces. Each of the two parties to the trade takes a stick. When they again meet for settlement, these sticks must match to complete the notches which were made in the stick of which they are a part. Any tampering with either half of the stick is thus easily discovered. Sticks have different kinds of notches cut into them, some to represent cloth, some tobacco and other articles.

Witnesses are supplied by the interrogator with a small strip of banana leaf for each question propounded to him. If he answers a

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question to the satisfaction of the court, he throws the strip backward over his head. This means that the implication contained in the question is far from him. If he does not answer satisfactorily, he lays the strip of leaf down by his side and stands indicted as guilty of the charge implied in the question asked.

It is said of him who thus retains the leaf that the leaf is always with him. To relate all of the peculiarities in the court proceedings of these peculiar people would take unwarranted space in this paper. Their courts are convened with the most solemn ceremony, and the silent space of time before the first speaker is introduced is almost sublime. That dignity which is one of the peculiarities of civil sessions is never entirely obliterated from a barbarous people when they sit in courts of dispute, though the wig and gown is conspicuously absent and the American style of honorable address is lost. That sacred demeanor of great assizes is visible and marks past civilization so indelibly that no honest observer can doubt for a moment that the African people were once an enlightened people.

They have a name for the Divine Being, but do not apprehend his character, nor how he is to be approached. The heathen want no teacher of God. They want a mediator. In Siam they take the white elephant and in Africa they take the moon. An African believes he will prosper if he is let alone. He does not ask for favors to be bestowed, but asks his gods to prevent enemies from hindering favors from falling to his lot. His destiny is prosperity if nothing interposes; hence his charms to keep the witch away. This is the original idea of the horse-shoe over the door. Over every African door is *some* charm. It was believed that this charm would change the mind of an enemy or witch who passed under it. That is the idea of the horse-shoe now, not to make good luck, but to prevent the witch of bad luck. If an African dreams of a person whom he knows or with whom he is associated, he visits that person the very first thing in the morning, and he says to him: "Why were you over to my house last night? What have I done to you that your spirit leaves your bed to bother me in the night? You must cease that kind of work, or I will accuse you of evil design." If he dreams of animals, he goes hunting in the forest next day, as he believes he will see game. The superstitious of this land who dream of numbers, or cows, or horses, consult a dream-book and play lottery. Many of the charges for witchcraft result from dreams and often end in the death of the accused.

They have many devices to detect thieves, most of which are

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superstitious tests, such as swearing on their country customs and sensitive leaves said to crumple at the touch of a thief. Any indication of a system of punishment for stealing may be regarded as a mark of civilization. Surely, the rights of property are held sacred among the enlightened nations. We may not claim for the Africans a moral abhorrence of theft, but that they regard stealing a trespass not to be tolerated is certain. The Bakundu tribes of the western interior fine the offender for the first, and under some circumstances for the second offense, but the third is punished by severing a lobe from the right ear. I have seen men, and women, too, with both ears entirely severed. Such a natural thief is called by them *motu wawibe*, or "a man who steals." He is also regarded as born to theft and is sometimes banished from the tribe.

One of their first ideas of a book or piece of paper was a strange one, namely, that no one could steal anything on which a piece of paper was attached; and a few months after our arrival they put bits of paper, on which something was written or printed, upon their banana trees, to prevent the elephants or people from troubling them.

Where did they learn the system of awards and punishment that lies at the root of our moral laws? Could it be inherited? We think not. It was a custom handed down by a better civilization.

There are natural thieves and there are naturally honest ones among them. Kimberly has its gems of matter, but Africa also has its gems of mind. There are faithful ones whose law seems to be, "Honesty is the best policy," and they are both humane and moral. They do not recognize the circumstance of accidental death, neither did the Jews. An eye for an eye and a tooth for a tooth. In Africa, he who kills another accidentally must die. Then, they say, the friends of each are equal mourners.

One of the most difficult duties we had to perform in Africa was to save a man from death who had killed another accidentally. Missionaries do much good among the wild tribes of the African interior by saving many from the fatal fiat of custom whose edict is death. In Bakundu language, *akalimba* means to crucify, and the victim is crucified in the following manner: The culprit is lashed to a tree with his feet two or three feet from the ground, his arms outstretched and tied to a cross-beam, so that the weight of his body would hang on his wrists. His feet tied loosely at the foot of the tree and his head hanging on his breast. After some time of suffering and before death they break his arms and legs with clubs. With such a

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similitude of ancient crucifixion, we have no hesitation in fixing this people's identity as descendants of the early enlightened peoples. And they—the Africans—are the only people who resemble the man whom David referred to when he said: "Wine to make glad the heart of man, and oil to make his face to shine." It is the custom of the Africans to oil themselves, and their complexion is one that shines under the process. If you oil a white man's face it will look wet, but not shine. They make wine of the purest kind, and they are very scrupulous in dividing the wine with their fellows, and I have known one to carry a mouthful of wine to his friend like a pigeon serves its young.

They regard a man who gets drunk as a witch, and he is not tolerated. I have seen a man who never drank wine, used tobacco or danced, and when I inquired why this was so, I was told that "he did not have that time in his body—*A sopikoppi ocbo punda O nyolo.*" They say he never desired to do so. David had many wives, and Africans, too, think the more of them you have the better. They are worth having in Africa. I do not mean this as a reflection on present company. But there is a single exception to the inference which I cannot remove. It is this: All there are worth something—from $50 to $250. There are, then, many marriages and few divorces. Here we have the reverse: widows bring the smallest price, and, anyway, always find suitors. You know how it is here better than I do. They begin payment when the girl is quite young, so as to complete payment by the time she is of age. The father buys his son a wife; the son is then started in life. Her wedding presents are not costly, but highly useful. They are: an axe to cut wood, a large earthen vessel to bring water in, and another one to cook the food in. If she is the third wife in rotation of his purchases, she is considered and considers herself more fortunate than the fifth or sixth. There are few who dissent from the bargain their fathers make.

The man of note in Africa carries no parcels. He who occupies a prominent position in Africa must not carry a package, however small; if he does, he loses caste and the respect of the people. Stores in England deliver the smallest package, even a paper of pins or a bar of soap. There as in Africa the gentleman or lady is not expected to carry a parcel on the thoroughfare.

The people of Africa have a systematic mode of computation. They count in an arithmetical manner: *Lundarro na makau, lundarro na bibba, lundarro na balarro*, etc.—ten and one, ten and two, ten

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and three, and on to five twenties and ten, one hundred and ten, etc. They shave their heads and cover themselves with ashes and sit on the floor to mourn, as did Job and those of his day. From whence did these people inherit these customs, if they came from baboons and gorillas, as some wise ones would have us believe? What about the native pride they possess, if they were only designed as hewers of wood and carriers of water? In their presence there you feel surrounded with a halo of ancient history, not a few paragraphs of which may be read on the faces and forms of these peculiar men. They have a language, and it is grammatical; 225 dialects in Africa, all springing from but two principal languages, and no doubt those two were permanent, as they have rules of grammar which could not possibly have been identical at any time. They take a pride in their language and speak it properly. In order to have a secret language that they may use in public for private purposes, they perform the wonderful feat of speaking their language backward, and no one who has learned their language can understand them in the rapidity with which they reverse every word of a sentence.

Is this genius of the brute creation, or is it not related to that high order of genius that runs railroads and speaks along the track of electric wires? They make wine and understand the processes of distillation, an art perhaps they might do well without, but yet it makes them akin to the distillers of this country, of whom we have not a few. They attain a knowledge of some of the metals, and there are metallurgists among them. They know they are malleable, and make rings and anklets (bangs) of gold, and tools of iron. On their houses also are pictures of snakes, lizards and men drawn with clay of different colors. Artists—a nation whose ancestors looked upon the wall of Carthagenia and beheld the work of masters of the pencil, and the handicraft is transmitted and remembered.

The tribes of the interior towns are not so large as those who live upon river courses or by the seaside. The reason for this is obvious. Water people, as those are called by the natives, to distinguish them from interior people, have bathing facilities, and they always have meat all the year round. Those who live remote from rivers suffer for meat every rainy season and often have no food of any kind. The elephants are numerous at this season and destroy the farm products of the people. It rains and they can hunt but little. When the ground is soft, the elephants can travel, but in the dry season the little stumps that would give way under them in the wet season

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pierce and bruise their feet so that they do not trouble the people, but remain up near the interior lakes and banks of large rivers, where the ground is soft to their feet.

Africans are of every cast of complexion, from white to dark. The worst fright I had, while in Africa, was occasioned by suddenly meeting an albino man while out hunting. For a whole year we had seen only dark people. No European had passed our way for eighteen months. I was not expecting to meet any white person in the jungle, much less a nude albino. Up to this time I had only seen children, and mostly infants, when all at once in the turn of a path I met this albino. Some tribes kill the albino infant, and so preserve a dark complexion throughout the tribe. They believe that the albino is the work of some evil spirit; they suffer it not to live. Other tribes think it is beautiful, and say, regarding the phenomenonof its appearance, that "nature was playing." So this white being they regard as a pleasant joke.

Black can turn to white, but white never turns to black. This looks like the final extinction of the dark races of men.

The arts and implements of the western tribes of Africa are few, but are ingenious and of ancient origin. In the absence of the gun, with which they are supplied by European trade, they use the cross-bow of early days, also various traps and nets of original design, the principle of which is borrowed from the early ages. One trap they use to catch animals of a large kind is especially worthy of mention. A dozen men pull a tree over and bend the top to the ground. They make a noose trap with a large loop, and attach to the top of this tree. A bunch of bananas is so placed that the animal that touches it puts his head through the loop, detaches a spring and frees the tree. They find their game suspended in the air next morning.

They have blacksmiths and silversmiths. These smiths make their farm implements. They make a new bellows every morning, when the dew is on the banana leaves and they are soft and flexible. The native surgeon has a case of three instruments. All persons who die are dissected, both adults and infants, and he decides the cause of death, which is, of course, of a superstitious nature.

Interior towns have a fire department. Three hundred men get as near a house which is on fire as they possibly can and simultaneously fire into and extinguish it. One-third of the guns in a town are always loaded. These people are fruitful of expedients—build houses and make canoes with only a cutlass and axe to work with.

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They surround a country of a mile square with nets of native cord, six feet high, and kill a hundred animals that are thus enclosed. They inoculate their bodies by puncturing the skin with a sharp instrument and bathing in a decoction of bark, which prevents animals from scenting them. One hunter thus gets so near a sleeping leopard that he brings him down from his jungle bed at one shot of his gun. They are good cooks, and they can make a monkey stew or elephant foot jelly fine and palatable enough to suit the most fastidious.

I believe that in the Bakundu language of the west interior of Africa we have a sample of the real original negro language. There are 225 dialects in Africa, all of which spring out of two principal .anguages—the Semitic, or Eastern, and Bantu, or Western. The Bantu is so called because *ba* and *tu* prevail through the western dialects either as anterior or posterior syllables. The Bakundu dialect admits of conjugation and has all the tenses but one, *viz.*: the past perfect. The language is poor in number of words, but rich in depth and beautiful figurative expression of a terse character. By the addition of an affix all adjectives are turned into verbs. (Ex.: *Lauli*—beautiful; *lauliseke*—to beautify,)

There lies a great future before this people when they overtake the sciences of our day, when they walk the furrow of a modern plow, when they know the culture of the nineteenth century and cross their squares in electric cars, when their nude and tattered modes of dress succumb to the fashions of modern ages, when the horse-shoe falls from over the door and the witch-charm is forgotten. They will read their own history in the gloomy and distant past and wonder at the days of darkness. A sage will be a historian, and *He* with a pen made of all the forests, and the sea for his ink, *He* will write the glorious ecstasy of modern Africa.

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6

ETHNOLOGICAL EXHIBIT OF THE SMITHSONIAN INSTITUTION AT THE WORLD'S COLUMBIAN EXPOSITION.

BY OTIS T. MASON.

IN the study of ethnology the following terms must be kept sharply distinct, though they apply to the same objects observed from different points of view:

1. Blood or consanguinity.
2. Language or speech.
3. Arts and industries.
4. Nationality, civil life and government science.
5. Systems of mythologic and philosophic religion.
6. Anthropophysiography, hexiology.

When the human species is studied from the point of view of consanguinity, the student is entirely in the area of zoology. Men are regarded as animals. They differ in biological characteristics. Under the influence of causes known and unknown there have come to be races of men. A race is a group of human beings that have lived in a certain area long enough to have acquired differential marks that are hereditable. The longer they live in that area undisturbed and unmixed with other races, the more specialized do they become. We can imagine a time when the centrifugal forces were most active in migration and colonization.

Departing from the original center or centers, groups of homogeneous people went out to be separated for centuries. For a long time these separated groups had no contact with one another. That was the epoch of greatest differentiation. The expansion of these groups in time brought their outer margins nearer together. A desire also to multiply the means of gratification set a-going commercial activities, and these two forces, overlapping, began to wear away the distinctions between races and to break up the discrete groups of men. All we can say now concerning the term "races" is that modified isolation still exists, and of any people it can be said that they constitute a race just so far as they are shut off from the rest of the world and are propagated by intermarriage alone. They should also present some definite biological mark.

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2. When the races of men were forming and the groups were segregated, each race developed a speech and a type of speech doubtless, though it is not here affirmed that the four great forms of language were thus produced. In that early time languages were originated by the races and were excellent indications of consanguinity. The men who spoke the same language were of the same people. So long as the centrifugal force was in operation alone, this was the whole truth; but when the races began to overlap and to intermingle, the causes which operated to produce mixture of blood did not operate in the same way to produce mixture of language. At the present time, therefore, the question of how far the possession of a common speech is an indication of the blood relationship of those who speak it must be kept entirely separate from the study of languages on their own account. The science of glossology or comparative philology is now studied by methods of its own regardless of the people who speak. Philologists do not pretend to be ethnologists.

3. Upon the third point, how to study arts and industries, it must be observed that in the primitive period of the races physiography suggested a rule for the arts, and society created a demand for their products. The activities of each race depended upon the atmosphere, its density, temperature, moisture and degree of purity. And intimately associated with these phenomena would be the amount of distribution of rainfall, dew, frost, ice and snow. Each region would also have its natural scenery, sea-shore, plains, lowlands and highlands. Also its mineral productions, its plants and animals, as a whole, would be to each of these areas a sort of *genus loci*. In contact with this environment of which I have just spoken each race would be compelled to invent a series of arts connected with food, clothing, shelter, developed in the exploration of nature for material and the preparation of the material in various crafts and the consumption of the product. The intimate association of these arts with the locality would operate independently of races when they came together in the centripetal process of commingling them. When the primitive consanguineous groups began to commingle, the arts did not necessarily follow the same rule. It is true and also interesting to note that groups of kindred in moving from the area have carried with them the industries of the fatherland. But these industries would not always fit into the new social and natural environments. For a brief period the love of old fashions and the knack of practicing familiar trades either kept the old art alive or preserved it with certain modifi-

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cations, but in the long run the people had to succumb to the order of languages inspired by the environment and were compelled to practice the arts that were dictated by Nature. When the ethnologist comes to study consanguinity and language and arts in relation to one another, this is his perplexity—that he cannot tell always whether a certain phenomenon is a survival of the old life or a creation of the new surroundings.

4. By nationality in this connection is meant civil government, whatever form it may assume. Whenever the phrase "Russian Empire, Germany, France" is used, it is well known that the lands and the people under the rule of the Czar, the Emperor and the President are meant, whatever may be their blood, their language or their occupation. In primitive society civil government belongs especially to the tribe or the union of tribes called the nation. The adoption of strangers into each body politic, especially of women, has always taken place, but to a very much less degree in savagery than in civilization. However, it is in this regard that men segregate themselves more readily than in any other. The Eskimo are of one blood, speaking the same language, practicing arts that are very similar, but they are split up into hundreds of little governments, in which the people are held together by the loosest kind of social bond, and which have nothing to do with one another. Among the civilized communities there has grown up a reverence for the government, called patriotism, and this, combined with the love of one's native land, comes as a strong motive in holding the people of a nation together. Not so in savagery. Among the American tribes of Indians, indeed, the strongest civilized bond is that of kinship, which, after all, is a racial characteristic.

The beliefs and philosophies of each separate people are the product of their entire life and experience. Types of beliefs with reference to this world, in which we live, and to the spirit world which lies all around us invisible, have been generated by the environment in which the people have been developed more than by their blood-relationship and language. The record of these is preserved in the language, but language does not create them. They are the creatures of the sun, the moon, the stars, the winds, the lightning, the rain and drought, great sheets of water, mountains, and even the commonest things connected with daily life. There is, therefore, the most intimate connection between the practical activities of the people, their artistic productions, their philosophies and their myths. With these ideas clearly in mind, as Curator of the Department of Ethnology in

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the United States National Museum, charged with the Ethnological Exhibit at the World's Columbian Exposition, I have endeavored to bring together the results of the labors of men connected with the Smithsonian Institution and with the Government for the period of fifty years. I have been led to do this in order to avoid interfering with the work of the Department of Ethnology at the World's Columbian Exposition at large.

An enlarged copy of the linguistic map prepared by Major Powell (16x12 feet) has been made and hung upon the wall in the Smithsonian space. Of the fifty-seven linguistic stocks the great majority of them are represented now by a very small number of individuals who have lost their own connection with their ancient aboriginal life except the few words and phrases of their language. These had to be neglected. Again, on the Pacific Coast, in the Pueblo region, and upon the plains of the Great West, the natural food supply and their environmental influence have invited the assemblage of a large number of linguistic stocks. But at the time of the discovery the North American continent was inhabited by Indians speaking a few great families of languages. These are, in alphabetical order, the Algonquian, Athapaskan, Eskimauan, Iroquoian, Keresan, Kiowan, Koluschan, Muskogean, Piman, Salishan, Siouan, Skittagetan, Tanoan, Wakashan, Yuman, Zunian.

So far as possible, I have arranged the costumes and art productions of these families in separate alcoves, so that the student taking his position in one of them may have before his eye practical solution of some of the theoretical questions which have recently arisen concerning the connection between race and language and industries and philosophies.

In order to afford the student another point of view from which to look at the same set of phenomena, a few alcoves have been arranged upon another plan, in which a typical industry is made the primary classific concept, tribe or nationality the second concept, and linguistic affinities the third concept.

In the Woman's Building I have arranged a large collection on the basis of sex. I have said elsewhere that Mr. Spencer's division of the history of culture into two epochs, the primitive one being called the age of militancy and the succeeding one the age of industrialism, applies more to sex than it does to ages of culture. Thus among uncivilized races or peoples there has always been a sex of militancy, of the male members of the tribe, and a sex of industrialism, meaning the female members of the tribe.

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The exhibit in the Woman's Building is really a form to show what has been woman's share in the development of peaceful arts. A portion of one of the four lower rooms around the center of the building is laid off into twelve groups of objects. In each group a certain art is traced in its manifestation among the three modern types of savagery, namely: the American, the Negroid and the Malayo-Polynesian. The arts thus laid out are as follows:

1. Preparing the food.
2. Serving the food.
3. Basketry.
4. Hand-weaving.
5. Loom-weaving.
6. Making of bark cloth.
7. Netting and crocheting.
8. Lace-making.
9. Pottery.
10. Primitive gleaning and carrying.
11. Grinding of food.
12. Carrying of burdens.

The space allotted has permitted me to make only a partial exhibit of these leading ideas of which I have just spoken. The results in their particulars may be here stated. As is well known, the Rocky Mountain region and the plains of the Great West were once the home of the buffalo, and the stocks that lived upon that area, the Siouan, Caddoan, Kiowan, Algonquian, and to a limited extent the Shoshonean, were dominated in their activities very largely by this fact, yet not all together, for the Pawnees lived in earth lodges, the fashion of which they brought from some other region, while the Siouan tribes lived in skin tents or tepees. The Shoshonean stock afford an excellent study of this question of environment as against blood and language and ideas. This stock occupies the Great American Desert or Interior Basin. In the north and east they were meat-eaters and dwelt in tents. In the south and southwest they are agricultural, dwelling in pueblos, and practicing arts unknown to their northern kindred. In this same pueblo region, where the people lived in adobe houses, cultivated corn, beans and pumpkins, and now have flocks of sheep, there are five distinct linguistic stocks—Shoshonean, Tanoan, Keresan, Zunian and Athapaskan. The Navajo tribe were also pueblo-builders, an art which their kindred, the Apaches, never began to learn.

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Of the fifty-seven stocks in North America, about forty dwell on the Pacific slope. The arts practiced by the people speaking these languages have been developed in connection with the natural resources of this coast. From the point of view of material, geographically, the Pacific coast may be divided into the Ivory region, the Black Slate region, the Giant Cedar region, the region of Textile Grasses, and the Arid region. From the point of view of food there are really two characteristic areas, the fish region and the nut region.

The black slate and the cedar lend themselves to the carver's tools, so that the whole totemic system of all the tribes is worked out into an infinite variety of carvings which are never absent from the house, furniture, clothing and the tools of the people. The inexhaustible supplies of fish and the extension of an archipelago for many thousands of miles developed the great fishing canoes, which are marvels of savage workmanship. The cedar bark, the long, slender pine roots and the textile grasses are the material causes of the wonderful variety of textile products in this region. The abundance of pine nuts and acorns in certain areas developed the harvester, the burden-bearer and the miller with their appliances. The bow and arrow had a remarkable development on this western coast. There is a lack here, as in the arctic regions, of hickory, ash, osage-orange and other different elastic woods, so the natives have been driven to substitute the most ingenious devices. The Shoshonean and the tribes of Oregon and Washington ply and put back of the broad, thin bow of yew a mass of finely shredded sinew mixed with animal glue. This was laid on so carefully as to seem a part of the wood, and with so much skill as to get the greatest result, without shrinking or breaking the wood.

The Eskimo arrived at the same result in another way. They make a very long twine of finely twisted sinew and apply this in the form of a cable to the back of the bow made of twin-wood. The arrows of the Pacific coast present the greatest variety in the world. It is impossible to describe them here. They will be minutely worked out in a paper which I am now preparing. It should be stated, however, of them, that in constructing each one of them the savage mechanic has been guided by the materials that were neat his hands and the kind of work that had to be done by his arrow. He has in each case placed marks of his individual ownership and of his tribe somewhere upon the shaft. But these marks leave no deep impression. They are only skin-deep; they are never of the first importance. The

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essential characteristics are due to environmental causes—the material out of which the object is to be made, the facilities for making it, and the work to be done.

The conclusion at which I have arrived from the arrangement pursued in the Smithsonian exhibit at the World's Columbian Exposition may be stated somewhat as follows:

The American aborigines are practically of one blood or race throughout the entire continent. Dr. Brinton emphatically proclaims this view. Professor Putnam seems to hold to a double race, two races in fact, one developed in the north, the dolichocephalic, and one in the south, the brachycephalic. The modern aborigines are a mixture of the two.

One thing is certain, that there are on this continent a great number of culture areas, where groups of people have gone and have developed hundreds of separate languages, social structures, sciences and mythologic systems. They have not remained there long enough to breed races with differential and hereditable characters. But they have in these habitats also worked out many series of arts, both in the practical and the æsthetic class.

As in all other parts of the world, so in America there is a law of relationship between the tribes of men and the culture area. There is an element of intellectuality and an element of materiality in each human product. The former belongs rather to the people subjectively considered, the latter to the soil, objectively considered. Language, civil government, science and religion not being made out of any material things, and being easily carried about and practiced from land to land, are of the subjective or intellectual class. These, language especially, being the product of people who are blood kindred, form the best guide to the study of race. It is not forgotten, however, that the human species has long since passed into the centripetal or congregative stage of culture, that every tribe has received elements of its language from others, and that whole masses of people have been forcibly compelled to accept the language of their conquerors. In such violent transitions, however, the conquered have often refused to intermarry, and have preserved the very best marks of race, namely, their zoological characteristics.

The Bureau of Ethnology of the Smithsonian Institution has most assiduously devoted itself to the investigation of the languages, the sociology, the science and the religions of the American aborigines. The results have been published to the world, and they agree with the

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statements here made that the differentiations among these savages have been and are largely upon the intellectual elements of activity, what Mr. Spencer has called the regulative side of industry.

It must not be forgotten, however, that in every one of the regulative or intellectual classes of action there is a material element. Languages are not only spoken, but written, and speaking and writing are not the only way men have of expressing thought. There is a proposition in every work of men's hands. Indeed, there are many propositions. The same is more true of social life, science and religion. Each one of these involves the use of places and things; of substantial materials, of apparatus, of activities of the body, of perceptible results. The acts of life, on the contrary, are in each culture area indigenous. They are materialized under the patronage and directorship of the region. As I have said, a man or a woman in doing work must have materials (mineral, vegetal, animal); he must work with substantial apparatus; the processal part of its work is bounded by natural forms and places and seasons. What he creates is a thing which may or may not be of any use anywhere else, since each industrial product is in a double set of relations, being the finished product of one trade and the tool of another. You can see how easy it is for a people to carry their speech with them, compared with the difficulty of transporting their effects, their impedimenta. Even though they do not actually carry the things, they must bear in mind all that enter into their making and their use.

But, as there is solid material associated with the intellectual culture concepts, so there is an ideal in all substantial activities. These are what the tribe or the horde may freely carry about. I have already spoken of this.

There are degrees of ideality among the industries of men, and the same craft passes on in its elaboration from the natural to the artificial, from the materialistic to the ideal. In primitive life each culture region decides what food, clothing, shelter and bed men must use. But, as they progress, they become independent of this law, they widen the culture area by the multiplication of wants and the refinement of taste until the whole world becomes an unique, comprehensive and undivided home for the whole race.

Already this dispersive work had begun when America was discovered. Commerce had scattered mineral substances far and wide. No one knows where the Pueblo people, the Mexicans, the Peruvians obtained their corn, melons and multitudinous beans. The history of

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the Plains Indians regarding their houses, bows and arrows, and even their dress, will be difficult to write. Even the ideal forms, the artistic forms and patterns, had begun to scatter and to possess this continent. It would be difficult to decide whether the curious shell gorgets described by Mr. Holmes were made on the spot in Tennessee from a shell bought in Florida, or bought already made in Florida by one who had migrated from Mexico; or bought in Mexico already made from a Florida shell and carried to Tennessee. The number of examples might be multiplied, but I think I have made myself clear.

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THE GERM OF SHORE-LAND POTTERY.

An Experimental Study.

BY FRANK HAMILTON CUSHING.

IN the winter of 1890–'91, I gathered, on the Canadian shore of Lake Erie, opposite Buffalo, a considerable collection of potsherds showing textile impressions of cordage and netting, both coarse and fine. These sherds were, in this respect, strikingly similar to the primitive pottery of other shore-lands along the great lakes, rivers and sea coasts, not only of the United States, but also of the Old World. Recalling the fact that I had very generally observed, in collections of ancient pottery from such sources, that these features were more constantly associated with the pottery remains apparently of fisher-folk than with those of tribes in other conditions of life, I was led to make careful comparison of specimens in collections from Oneida, Cayuga, Onondaga and Chautauqua lakes, as well as from the shores of Lake Ontario, with specimens in collections from interior portions of the State, also abundantly represented in my boyhood gatherings. The result was striking. I found that in no case did these features of the shore-land pottery of at least the largest of these lakes characterize to any extent the inland pottery. On the other hand, the pottery of the lake shores, even when, as shown by associated relics, it had been the work of tribes from the inland (probably during their fishing seasons), rarely showed characteristics of inland decoration or form. This led naturally to the conclusion that something in the habits and practices of the fisher mode of life itself had influenced the methods of manufacture, development of forms, and even decorations, of pottery in ancient fishing-camps, especially of such vessels as had evidently been used for cooking.

In view of this conclusion, I more carefully examined the rich Erie shore middings, seeking not only for relics themselves, but also for any traces in the soil or hearth-sites which might help me to determine how clay had been procured, manipulated, fashioned and burned to form so distinct a type of ware. In an outlying portion of the large camp-ground I was examining many of the midding-sites had almost disappeared, the wind having drifted the sand away from

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them until only the foundations of hearths and the heavier stones and implements once used about them were left. In such places I found, now and then, rings or circles of indurated and more or less blackened and reddened sand, varying in size from a few inches to a foot or more in diameter. The contiguous denuded hearths were characterized likewise by reddened and blackened sand, which occurred, however, in patches more or less continuous and not so round, not in circles. Stones, too, showing the effects of fire, always appeared within or around these larger hearth-patches, although not always found directly associated with the circles in question. I concluded, therefore, that these circles had been formed for use in some special process, and was inclined, at first, to believe that they had been used in firing pottery. On carefully excavating some of them, I ascertained that they were the remains of conical concavities or pits, their bottoms and sides quite compact, as though a small quantity of clay or mud had been mixed with the sand composing their perimeters and had hardened by drying or by having been burned. Thus these rings were, it would seem, the worn-off edges of such conical, sometimes funnel-shaped pits, recalling the large mescal pits and ripening-ovens of the Southwestern tribes, and at once suggesting that these small sand-pits may have been modeled after pits in the sand once likewise used for baking, say fish or other food.

Reminded of a practice of the wandering Walapais (Hualapais) observed by me whilst exploring the plateaus of Western Arizona in the summer of 1881, I was the more inclined to take this view, yet to modify and amplify it considerably. These Walapais live among the great lava buttes and on the desolate arid plateaus to the west of Cataract Cañon in Yavapai County, Arizona. During dry seasons they store water in sandy arroyos or at the foot of lava gulches, and even in the coarse talus, simply by forming pot-shaped pits, sometimes of considerable size, and plastering the bottoms and sides of them with clay. Without further ado the water is introduced and covered over or sealed to prevent evaporation. The clay, even though plastic, renders the porous soil or talus in which these water-pits are excavated perfectly impervious, so long as they contain enough water to keep it thus plastic or moist.

I conceived that the mere observation of nature had in times past taught these rude people this simple and ingenious expedient. In that desert and sandy region heavy showers fall during certain months, filling the arroyos with freshets which, when the rain ceases, speedily

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disappear, flowing rapidly away and being drunk up in the porous, sandy bottoms. Often, however, these arroyos cleave through argillacious banks, and some of the clay of these, being levegated and washed down by the rushing water, is deposited in depressions along their courses, especially where these are deep or occur at turns or eddies in the arroyos. Thus, these water-worn hollows or pits are lined with fine clay silt, and long after the stream has disappeared in other places, and the surrounding bottoms are parched and dusty, the traveler may find water in the natural clay-lined reservoirs thus formed, and readily learn, as the Walapais of old have learned, the lesson they convey.

Returning to a consideration of my theory regarding a possible early use of clay-lined sand-pits for cookery, it now occurred to me that if such were used they might in turn have been suggested by like observations—say at the mouths of streams along sandy, freshet-washed shores—and might thus have come to be made and utilized not only for baking, but also in boiling, by means of hot stones. Indeed, it seemed to me that this latter may have been the earlier use connected with them, and that, if so, the discovery of pottery-making in pits, or of its possibility, must have followed more or less speedily on such usage, and that, when adopted, the practice of fashioning pottery, especially for cooking, by more thinly lining such sand-pits with suitable clay, drying, and then firing them, would have become normal, and might naturally have persisted to quite a late day.*

I therefore determined to test these inferences by experiment. On returning home, I gathered clay and a quantity of sand. With the

* On examining the proof-sheets of this article, Mr. F. W. Hodge, of the Bureau of American Ethnology, has kindly called my attention to a passage in the work of Stephen Powers (*Tribes of California in Contributions to North American Ethnology*, Vol. III, p. 150, 1877), which substantiates almost step by step this course of reasoning, the more so, as the reasoning in question was based wholly on the observations and experiments recorded in the text, and without knowledge that any living tribes had been observed actually using clay or mud-lined pits for stone-boiling, etc. Speaking of the Pomo Indians (a coast tribe of Northwestern California), Mr. Powers says:

"Buckeyes are poison, but they extract the toxical principal from them by steaming them two or three days under ground. They first excavate a large hole, pack it water-tight around the sides, burn a fire therein for some space of time, then put in the buckeyes together with water and heated stones," etc.

I do not doubt that further observations of other tribes of the Californian coast would confirm, by living examples, yet other steps in the development of pit-made pottery as traced later on in the pages of this article.

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latter I made a pot-shaped pit like those I had discovered the faint remains of, rubbing thick clay-water around its perimeter to make the bottom and sides firmer, and keep the vertical portions from caving in. I allowed this form to dry. In the course of only two or three hours it had become comparatively hard. I then mixed clay-paste, with which to form, inside of the pit, the walls of a vessel. Whilst the bottom and the lowermost portion of the sides of an incipient vessel could thus be formed with great ease, I soon found that it was nearly impossible to cause the thin wall of clay to adhere and thus retain its position higher up. It then first occurred to me that strips of bark, or fiber, or netting, might be pressed into the pit and used not only to hold the clay in place around its sides whilst being built up, but also to aid in lifting the green vessel out when fashioned, for drying. I therefore roughly netted together some coarse cordage in the form of a bag of suitable size and introduced this into the pit. The first experiment made proved a failure. When I had built up the clay nearly to the margin of the form, its sides collapsed inward, netted cordage and all. Again I proceeded as before, this time, however, weighting the edge-strings of the bag down to the surrounding surface with rocks. I succeeded perfectly in fashioning the vessel; but, on endeavoring to draw it out, found, of course, that it would be necessary to lift evenly on all the edge-strings, else the still soft vessel would give way or at best be utterly distorted when taken out of its mould, by the unequal strain of the strings. It very quickly occurred to me that these difficulties could be overcome by attaching the strings to a hoop, then lifting the vessel out by means of that. Following this plan, I succeeded completely. The vessel left its bed easily, retaining its shape at the bottom and sides perfectly, but both the net and the hoop happened to be too small, hence the rim was puckered in by the tautness and indrawing of the strings near the edge and was thereby considerably contracted (as shown by lines *a*, *a*, *a*, Fig. 2). I managed, however, by scraping the inside of this rim with clam-shells, to at once thin it and restore its roundness without causing it again to enlarge. I found, moreover, that I could cause the vessel to contract still more just below the rim, by constricting it with a band tied around the net-support at this point, (*b*, *b*, *b*, Fig. 3), then repeating the scraping process (on the inside) to again smooth off the puckerings or corrugations thus made and to reshape and toughen or weld the rim and constriction. After smoothing the outside of the vessel here and there where its weight had caused the cords (especially at the

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bottom) to cut into it and form protruding lumps or bulges between the meshes, I suspended it to a couple of poles, supported horizontally, and left it to swing and dry in the wind and sun. Thus exposed, it set within an hour or two, becoming so firm that I successfully removed, by a sort of gradual peeling-off process, as one takes off a tight glove, the netted bag in which it had been suspended. After it had been slightly dressed down and welded where necessary by more scraping inside and out, with clam-shells, I was surprised and delighted to find that its general surface presented almost the exact appearance of the outer surfaces of the sherds I had been finding, save that the textile impressions were coarser in my specimen than in the ancient ones. Another feature of resemblance was even more striking. The greater number and slight obliquity of cord impressions at the

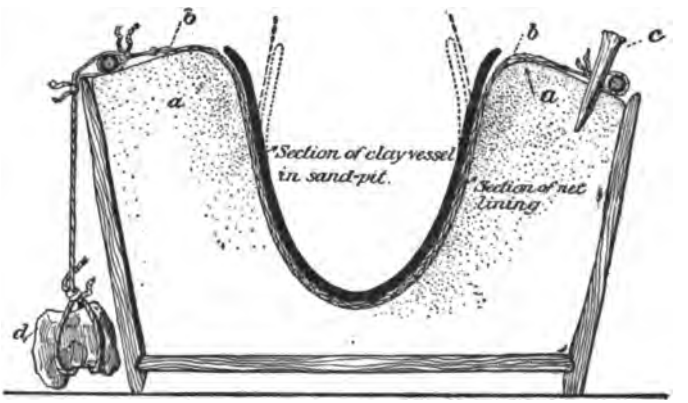

Fig. 1.

rim, where by binding in the meshes I had caused them to gather or closely approach each other, and by the scraping process in the forming of the neck had caused them to become slightly twisted or strained sidewise, represented so faithfully the markings on some of the rim potsherds I had found, that I could no longer doubt I had followed approximately identical methods in the making of this experimental pot which the ancients long before had followed in the making of their veritable ones.

After this I lost no time in providing myself with a better sand-form enclosed in a very large tub (Fig. 1), and with an elevated margin or bank of sand around it (*a*, *a*), over which to stretch the edges of my hoop-net (*b*, *b*), and peg or weight them down when in use, as shown in the accompanying sketch (*c*, *d*). This form I made very

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large, in order to test my discovery to the utmost, by shaping in it a vessel as large as any whose remains I had ever found. I also studied the impressions of knots and meshes on the ancient sherds, and then proceeded to make a large conical net-bag with identical (rather small) meshes and knots, fastening a stout hoop to its mouth precisely as dip-nets are formed and fashioned.

I observed that the potsherds I had collected had been made of ordinary red clay-paste heavily charged with a tempering material of either calcined and pulverized stone (usually granite) or of burnt shells, or of both. Familiar with the fact that clay requires a *degraissant* or tempering material of some sort to keep vessels made of it from cracking, whilst drying, I was nevertheless surprised that sand—the usual and in these cases seemingly unavoidable admixture—had been used very sparingly. At the same time it was obvious that, if my theory in reference to an early use of sand-pits, plastered with clay to render them water-tight for stone-boiling, were correct, then the merely accidental introduction of burnt stone, or of calcined shells occurring about the hearth in or near which the boiling-pits had been made, would sometimes occur. And, in case a pit boiled dry, or was used for baking, as no doubt it often might be, and its lining happened thus to be burned to hardness, then, sooner or later, the sufficiency of these pit-linings themselves, as well as the value of such admixture of foreign materials in preventing their excessive shrinkage and cracking, would become apparent.

Still, the preference of calcined shell or stone and sand as tempering stuff remained to be accounted for. I therefore procured some fragments of micaceous and feldspathic granite, and a quantity of mussel-shells, and separately calcined them until nearly friable, then mixed and pulverized them on a flat rock with a cobble-stone, proportioning the burnt stone and shell (more of the latter than of the former) as they appeared to have been proportioned in the ancient potsherds, and mixing them thoroughly, by kneading, with moist clay. With this mixture I built up inside the net (introduced into the sand form, of course, and held in place by four or five pegs inside of its wooden rim) a very large pot. The clay-paste thus mixed was sufficiently adhesive, yet not so sticky as the paste made simply with raw sand and clay, but even the thin walls formed of it were firmer. It possessed another and unexpected quality: it hardened so rapidly whilst being built up that I had to work fast to finish the pot ere even the mass of it in the lump had become too stiff for use without remoist-

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ening and remixing. By the time I had built the pot up eighteen or twenty inches (the pit was nearly two feet deep, conical, and about eighteen inches in diameter at the margin), the bottom and lower sides had already set. I at once, therefore, lifted the vessel out of its form, suspended it as before, and, by passing cords in and out of the meshes like a drawing-string around and just below the rim (*a*, Fig. 3), caused this, which still remained plastic, to contract to the desired size of the mouth and neck, then rapidly finished off by scraping inside, as in the first instance. The whole operation had been so easy, and had required so short a time, that I determined, whilst waiting for the big vessel to dry (after removing the net and re-introducing it into the pit) to try other experiments. I therefore mixed some more paste, this time adding only calcined and crushed shells as tempering material, again in the proportion exhibited by ancient specimens of the more delicate sort.

This paste required more water in kneading, but was nevertheless, while more plastic at first, firmer and still less adhesive than the former mixture. But it also hardened much more rapidly—measurably as does hydraulic cement,—and it was impossible for me to build the pot up in the pit and net more than a few inches before my material (in the lump) became too hard for use, because—as I soon

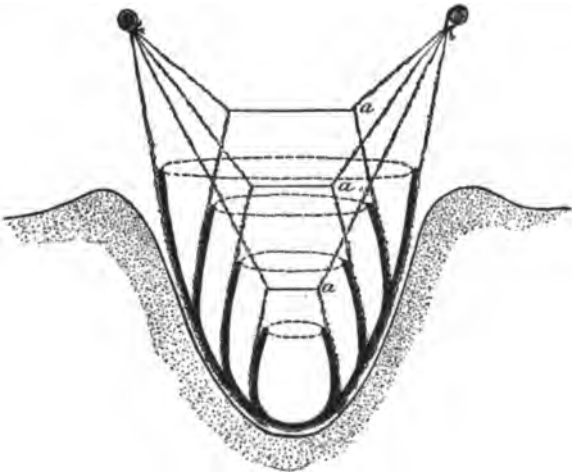

Fig. 2.

learned—of an excess of calcined shell. This was a fortunate accident, however, for I found that, by lifting the unfinished bowl-shaped vessel out, I had only to hang the net up, lace it in at or above the un-

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completed rim as before (see lowest section, *a*, Fig. 2), and behold, a miniature pot, in shape quite like the last made vessel, was produced, merely by a little finishing-off. It became obvious that, as the accompanying diagrams (Figs. 2 and 3) illustrate, vessels of any size, from the capacity of a pint to that of many gallons, could be formed in the same pit, and also by use of the same net. Thus, conical vessels could be made by tying the net in *above* the rim (as at *a*, *a*, *a*, Fig. 2), or could be made pot-shaped by tying or gathering it in *below* the rim (*b*, *b*, *b*, Fig. 3).

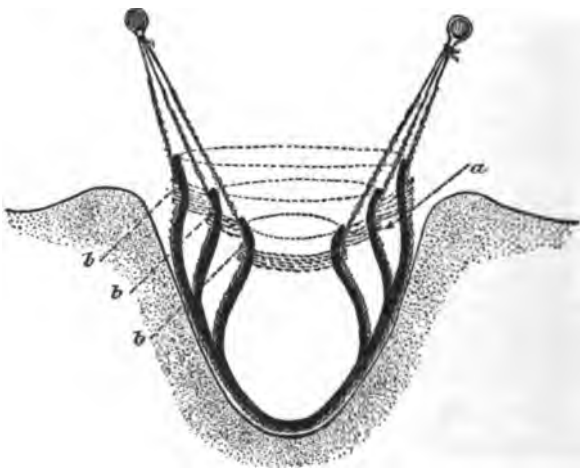

Fig. 3.

I tried yet another experiment, that of forming a third vessel of clay mixed only with the calcined stone. To some extent this paste partook of the nature of the shell-mixed paste, but it set a little less rapidly. Singularly enough, however, it was not so tough whilst moist, yet harder, and not therefore so deeply impressed by the supporting net cords, or so easily reshaped when setting after having been taken out, being less plastic; but, the material being "shorter" so to say, it was much more readily finished by scraping.

The relative value of these three admixtures to clay-paste, namely, burnt shell and stone, calcined shell alone, and burnt stone alone, remained to be tested by firing. I constructed a very simple kiln of stone and mud, fragments of fire brick, etc. (being desirous of burning all three vessels equally, hence together, and therefore abandoning for the time being the burning of them in separate sand-pits), and subjected them therein to a red heat for some three or four hours.

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The vessel first formed (of paste mixed with calcined stone and shell combined) was better in some respects than either of the others. The shell material had acted on certain components of the granite to very partially flux them, and the resulting ware was good, ringing, brick-like earthenware, like by far the greater number of ancient specimens. The second specimen (of shell and clay only) was not so strong, although beautifully burned. It had slightly scaled in one or two places, was somewhat softer—easily scratched with a flint knife—and tended to disintegrate in spots when in contact for any length of time with water, again the result of too great an admixture of shell; for the latter, converted to lime by the firing, tended to slake and expand when too much wetted.

By far the most useful, though not the strongest ware, was that made of the clay mixed with calcined stone only. It was neither much affected by the heat, nor by water, and would have served admirably as an every-day cooking-pot had it been less fragile.

To overcome the latter defect, I therefore, in a subsequent experiment, introduced calcined shell in greatly diminished proportion, increasing by as much the amount of calcined and crushed granite; with the result of producing a ware which was at once very strong, like the first, and, like the last, sufficiently fire- and water-proof to serve all ordinary primitive culinary requirements. I found that in the absence of shell a paste consisting of much more calcined stone than of clay would set so rapidly that it could be built up, strip by strip or lump by lump, without much support. This made a ware so coarse and friable, before burning, that it had to be reinforced by a thin slip-wash or external coating of fine or "fat" clay-paste and sand and by weld-scraping or patting with a spatula of shell or other material. The surface of such a vessel took a very smooth finish, was easily indented by the finger-nail, or with stick and bone tools, and when properly decorated by these means, and burned a long time, exactly resembled that of the inland pottery. This resemblance extended as well to its composition after burning. A fragment seen in section consisted apparently of three layers: an outer, moderately thin coating, a medial, dark, stony, rather thick portion, and an inner, smooth, very thin and black lamina, or, rather, surface. This latter had been produced by the inside scraping or "welding," the "washing" and the smoothing processes. That is, the inner surface, having been rendered even and thoroughly blended where paste had been added to paste, by scraping and patting with the edge and flat portion of a

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shell, then smoothed by moistening and rubbing with the rounded portion of the shell, all fragments of the stone or grit had been forced toward the center into the mass or medial portion and an excellent surface left for "smudging" by the smoke which accumulated inside of the vessel whilst being burnt in an open rotten-wood fire. The outer surface coating formed a distinct layer firmly adhering to the gritty middle portion, but presenting a red or lighter contrasting color, and, of course, a finer texture. In all of these respects the ware of my experiments last recorded as closely resembled, when broken, the sherds of pottery from the inland camp sites as fragments of the earlier experimental products did that of the shore-land middings.

It is not my purpose to analyze in the present paper the processes of pottery manufacture as practiced by the tribes of New York under the influence of their inland, forest environment. I have studied them out to the minutest details by like experimental means, using, in place of sand-pit forms, stitched or separate bark piece-moulds, and basketry, matting and pieces of other textile in place of the dip-nets. I have mentioned a few of these processes here, chiefly to exemplify and emphasize the importance and function of the *degraissant* or tempering material and its varying kinds, as seen in various qualities of this ware. It became evident to me that superiority of strength and immunity from cracking, however important, were but secondary, or, I may say, incidental objects to the primitive artisan in the adding of coarse tempering ingredients to his terra cotta material. His first or most conscious object was to make a paste which would be short, not too sticky, and would set rapidly and thus retain its shape whilst being moulded, principally (in case of inland tribes) by hand. He had discovered in ways I have above indicated and in other easily conceivable ways that *burnt* stone, *burnt* shell, *burnt* sand even, mixed with clay, was superior to unburnt material for giving it, to some extent, the quality of a true hydraulic cement, which could nevertheless be slowly built up if sufficiently worked and welded during the operation, and, when left alone for a few moments, had the remarkable property of hardening or setting, although still moist, sufficiently to keep its shape. Therefore, much of the lacustrine net-impressed pottery, formed, as it apparently was, in sand-pits, and held in shape by them, as well as, whilst being dried and finished by suspension in a dip-net, as often as not contains but a comparatively limited amount of tempering material, and that chiefly of burnt shell. Much of the inland

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pottery, however, which was moulded up by hand or with but the slightest supports of plaited, splint, or wattled basketry, bark, or wooden forms, contains an excessive amount of burnt, coarsely crushed rock, into which is sometimes introduced a little calcined and powdered shell or even bone, by which admixtures the paste of which it was made was converted into a cement easily manageable and, when fully shaped, susceptible of leisurely and elaborate finishing, even after drying.

I may add that with primitive peoples who use rotating base-moulds (like those of the Zuni, which, being convex-bottomed, readily turn, and form true archetypes of the potter's wheel), by being able to build or coil up very green or plastic paste and model it freely even before setting, finer (in fact, very fine) tempering material may be and is used, such as sifted sand or ground stone, more with our own idea of merely communicating strength to their fictiles than of facilitating the moulding of them. But even amongst such peoples calcined material is resorted to whenever a work of peculiar intricacy and difficulty is undertaken in which much hand modeling is needful. In such case, burnt stone or powdered and sometimes recalcined potsherds are used as the tempering-stuff.

But in the case of ruder peoples of the interior, like the Iroquois or their predecessors, the process of pottery-making was more difficult and tedious, as has been partially and might be far more fully shown. For this reason and because of the greater availability of the stone-clay ware for general, and particularly for cooking uses, it was both more highly prized and more finely finished than the shore-land pottery of the same peoples. It was, however, very heavy and quite easily broken, hence not readily transported.

On the other hand, the sandpit-formed and net- or textile-supported pottery, while limited in variety of form, not so easily finished or highly decorated, and not quite so serviceable, was still very well suited to temporary use. It was so readily and rapidly made, moreover, that the pottery of the home camps (especially that used in cookery) only very rarely needed to be transported to the fishing-grounds on the shores of the lakes and great rivers. In illustration of this I may state that, although a novice, I was able, by using the sand-pit mould and dip-net support as described, to turn out in a single day (the third after beginning these experiments) vessels large and small to the number of half a dozen or more, which on the following day would have been, had haste required it, quite ready for firing.

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Although some of the explorations which led to these experiments were carried on when I was a boy, and although the experiments themselves were begun more than two years ago, I have lacked, until quite lately, the conclusive evidence of such primitive *sand-pit cooking* as I had assumed naturally prevailed at first among peoples living along the shores of considerable bodies of water, and maintaining themselves, partly at least, by fishing; hence using dip-nets, etc. During my stay at the Columbian Exposition, however, happily I was invited by Mr. D. H. Burnham, Chief of Works, to visit for a day or two his pleasant home in Evanston, close to the south and western shores of Lake Michigan. During this visit I explored high, sandy bluffs lying northward of the Northwestern University Reserve, and there discovered in one place some exceedingly ancient middings. In these no pottery occurred, yet traces of sand-pits such as I have described, but ruder and shallower, were found, and around them plentiful boiling-stones (reddened and crackled by alternate heating and immersion in water) were also found, indicating that probably these pits had actually been used as boiling-holes or pots, so to call them. I therefore now feel measurably certain, not only that forms in sand could easily be used, and would naturally come to be used in moulding and burning pottery by rude fisher or shore-land folk, but also that the practice of cooking in clay-lined sand-pits by means of heated stones would as easily lead to this use of such forms and might explain much in reference to the employment of burnt shell, burnt stone, etc., in pottery-making throughout widely separated regions of the earth. It would explain equally well the still wider prevalence of textile impressions on pottery like that of our eastern and southern camp-sites, either as indicating the use of cordage, netting or cloth-forms, at first, for supporting the clay whilst being fashioned into vessels, or else as the survival of such usage in manipulatory processes suggested by it, and in decorations suggested in turn by or practically growing out of experiences involved in such processes.

Numerous examples of pottery from here and there the world over, made apparently in pits and with nets or bags, that is, so completely resembling the products of my experiments as to serve admirably for illustrating them, the processes by which I produced them and the observations suggested thereby as above recorded, might be given in detail. Still more numerous examples of pottery showing important variations in decoration and form almost unmistakably derivative

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from such beginnings and processes might also be referred to. But my purpose is, for the time being, to simply suggest and in a merely general way to evidence the probable influences which led to the first origins of the primal types, the first use in them of burnt shell and crushed stone tempering material, and the first beginnings in them of the widespread practice of working, finishing or stamping the surfaces of vessels, highly differentiated from such primeval sand-pit types in almost every other way, with cordage, netting and textiles, or textile patterns.

The extremely easy steps by which a fisher-folk using dip-nets, and continuing to cook their fish, etc., with hot stones in clay-lined sand-pits, would discover at once the useful terra cotta quality of clay when burnt, and all the processes by which it could be manipulated to render it thus useful, would lead, I think we may safely conclude, to the making of such pottery in quite identical ways, yet independently, by widely separated peoples. The practice of storing water in clay-lined hollows is, as has been shown, suggested by nature. The practice of cooking fish, at any rate, (and other food, such as was generally eaten without broth or its liquor), in such hollows, would be a very simple additional step to a people used to cookery with hot stones as so many of the most primitive tribes of men have been. Thus the discovery, sooner or later, that the clay lining repeatedly used and repaired with gritty plasterings was better than a new one, and that when burned it might be used without hot stones by the removal of some of the sand from around or from underneath it and the direct application of fire, and finally that it might be removed and thus used even apart from its original sand-bed, would as naturally follow; and with the use of the dip-net in fishing would come, sooner or later, also the suggestion that the clay lining might be made thinner and held up in forming, and lifted out for drying by the net (from the pit it was formed or bedded in), just as this suggestion came to me through study and experiment with similar appliances and materials and under similar conditions. The best indication that this is practically the history of repeated discoveries of the potter's art by widely severed peoples and at very various times, lies not alone in the universality of net- and cord-impressed ware alongside of or within the regions contiguous to nearly all great bodies of water the world over, and the still wider distribution of pottery with a shell tempering material, but also in the fact that the ruder and presumably earlier types of such net-impressed pottery are almost always conical, high, comparatively wide at the

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mouth, and but slightly constricted at the neck, as though built up inside of a mould of increasing diameter, in order that they might be more readily lifted. It may be well to add that a vessel of this form is better adapted practically (as well as by survival of association) for cooking in sandy places. Like the boiling-pots of the Navajo on the sandy plateaus of the Southwest, it could be readily set up for cooking by thrusting its tapering base into the loose, heavy sand and building a fire around it.

When, however, cooking with pottery began to prevail in the forests of the inland, where surface and other conditions were quite different, the vessel had to be made differently to meet different requirements and to facilitate suspension or propping up. It had to be made narrower at the neck than a vessel simply formed in a net could be made, and its rim or upper portion at least had to be very wide or flaring, therefore necessarily formed in other ways, the use of a heavier and more abundant tempering material, for instance, being employed to facilitate manipulation. It needs must have not only a greatly expanded rim or border to facilitate suspension, but also wider shoulders below the neck to protect from burning the sapling hoop, bark or fiber binding, forked wooden props or other device by which it was suspended over or held up on a fire—in this case probably built underneath rather than around it.

Thus, and through the influence of bark and wooden vessels so common to the forest life and so likely to be used as models (if not wholly or in part used at first for supporting the clay of which vessels like them were being formed), a great number, at least, of the variations in the types of inland pottery from the types of shore-land pottery may be accounted for, even when the inland pottery was evidently made by the same people, who continued more or less to make the old kind of shore-land pottery, as apparently the New York tribes did.

It may be inferred that peoples of the farther interiors, who continued the use of burnt shell tempering itself—though they varied their methods of working clay, as did the mound-builders—or who used other tempering material, yet continued to give a textile-marked finish to the surface of their wares, as did many southeastern tribes, that such a people had some time been shore-land dwellers, or else had directly inherited or derived their art in clay from shore-land dwellers.

This becomes the more apparent if we consider that a people who, like the Zuni and other Pueblos, developed (or perhaps re-developed) their art of pottery through the use of gourds and water-tight basketry,

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etc., as I have shown in my paper on this subject in the Fourth Annual Report of the Bureau of American Ethnology, never introduce a shell tempering into their ware, not having, of course, in their arid, almost waterless land, passed through a fisher period of development at such time as to affect their development of the art itself.

It is not unlikely that during the earliest time of the human occupancy of this continent tribes of men were scattered only along the sea-shores, where the presence of shellfish as well as of free swimming fish and crustacea assured the comparatively easy acquisition of a constant food supply. It is quite as likely, we may suppose, that when tribes, grown numerous and therefore contentious over these natural vantage-grounds, drove some of their numbers to penetrate the interior, these followed the great water-ways, loth to part with the mother-like element which had so long maintained them and had fostered their increase until some needs must move away. To those who perforce first braved the wilderness, the lakes became new homes, where in part their old fisher life could be continued, and where new conditions could be gradually met and mastered.

Those who in turn, grown hunters rather than fishermen, ascended the rivers and streams which led down to these lakes, peopling woodlands and valleys, still, as a rule, returned each season to draw new life, as it were, from the waters. In eastern and southern regions, at least, they did not wander ceaselessly. The forest, with her teeming winged and four-footed denizens, became their new mother, inviting them to stay in every favorable valley, not to constantly shift their places of abode. And so into the forest they could well carry their potter's art born of their earlier fisher life, not finding it less useful, but more so than on the shores, and slowly modifying it to meet new conditions, yet retaining to the last certain survivals of the art as originally developed.

Such, for example, would seem to have been the case with the ancestral Iroquoian tribes. In their ancient forest strongholds the sherds of their fictiles are almost as varied in form and decoration as they are numerous, differing essentially, yet along distinctive lines, as I have already stated, from either their own shore pottery or the pottery of other peoples on coasts or lake shore. It would seem from this that they must have been for many generations a forest people more than a shore-land people, the comparatively shallow, narrow-necked, wide-rimmed and broad-shouldered style of their cooking-pots, as well as the extraordinary fashion they had of making the majority of the rims

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or borders of these pots more or less angular (that is, three, four or five-sided) and of decorating them with stitch-like nickings and quill-like line-drawn markings, showing the influence of folded and stitched bark vessels quite as much as the necessity for suspension over the fire in forestry use. In a line with this is the fact that as a rule (with exceptions, of course) the pottery of the northeastern Algonquian tribes at least is, if I may judge from examples I have seen in New England (and even from Virginia), relatively deeper, more conical, relatively narrower at the shoulders than at the rim, more decorated with cord-, net- or textile-impressed or stamped markings than with straight-lined incisions, and, above all, is more generally characterized by a shell tempering than is the inland pottery of the Iroquoian tribes. And this would seem to indicate that as a rule, while the pristine Iroquoian was a forest-dweller, the Algonquian continued longer to be a man of tide-water regions—not a forest-dweller to a sufficiently exclusive extent or for long enough periods after penetrating inland to work such marked changes in his pottery art as were wrought in that of his more exclusively forest-dwelling neighbors. In the case of his relatives in the far West, he seems rather to have forgotten his potter's art as he penetrated the desolate reaches of the northern regions, in his slow shifting thitherward, until, coming out on the borders of the great plains, we find him returning to his stone-boiling, using (as did the Blackfoot Algonquians) green skins instead of clay wherewith to line buffalo wallows or artificial holes for this purpose.

So the tribes who, pressing on, passed the forests and entered the great plains; the peoples driven down from the high north into the land of the bison; the punier tribes of the Pacific shore seeking refuge in the mountains and in the great arid wastes they enclosed—we may judge that at first all of these speedily cast away their pottery as too fragile and cumbersome for transport in their life of ceaseless wandering. And we may also well suppose that by many of them the potter's art thus disused was wholly forgot, stone-boiling in skins, as with the Blackfeet and other plains tribes, or in comparatively light water-tight baskets, as with the Utes and Walapais, replacing it for so long as the wandering life was maintained, then giving rise to a new genesis of the potter's art—like that of the Pueblos and Pimas, when through stress of circumstance and the necessitous adoption of horticulture their ancestral tribes came to rest once more.

One may reasonably ask why, if the discovery of pottery-making by coast or shore-land peoples was so simple as to have been al-

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most inevitable—as has been assumed in the preceding paragraphs—why *all* coast or shore-land peoples did not practice that art. It may be answered that well-nigh all such peoples, to judge by the ancient remains gathered from the sea shores, lake shores or the shores of great rivers in all lands, *have* practiced that art. Whenever we find an exception to this widely prevailing rule, we may usually find an immediate cause therefor. For example, numerous tribes of the Northwest Coast, considerably advanced in other arts, had made no progress in pottery-making when first found by voyagers. The reason for this was simple. They lived in a country which furnished easily worked material, like the redwood and spruce of their region, the soft black slate and fire-proof, easily-carved marls so abundant there. Nor is it wholly certain that these tribes, as found in historic times, had been coast-dwellers uninterruptedly from the earliest times, for their art in basketry and horn, etc., seems to indicate that they had one time or another been influenced by quite different environments, and that, when finally settling on the coast, they were already supplied with portable vessels for their stone-boiling, obviating the necessity for using the crude boiling-pit of Nature's ready suggesting. Yet even here there was a time when their own ancestors or their remote predecessors on the coast, as the case may be, did know the potter's art in one of its crudest states, as shown now and then by remains found as far north as Alaska.

Again, the islanders and some of the coast tribes of Southern and Lower California did not, when first found, make vessels of clay. But again these peoples were living in a region where exhaustless supplies of superior steatite occurred, and this, even had they earlier discovered the possibilities of clay, they preferred, no doubt, as being more durable, for the material of their cooking-pots. Nevertheless their predecessors, too, had also been makers of pottery; and the sherds I have gathered from the oldest middings there are absolutely identical except in quality of clay with those of the Atlantic and the great lake shores.

It may be quite possible, then, in view of all this, that the potter's art, instead of belonging to a late period in man's development —at least here in America—belonged to one of the earliest periods of his occupancy of the sea-shore and lake lands. That in some regions like those of the East, where the forests were dense and the lakes numerous, inviting to comparative permanency of abode, this art may have been handed down as an unbroken heritage even in the interior.

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But that in other regions the art may have been disused and forgotten, rediscovered and forgotten again, or with changing conditions rediscovered in other ways, affecting total changes in its product of types as well as in the degree of perfection to which it was carried, as was the case with the basket-pottery makers of the great Southwest.

In conclusion I may say that the statement ventured by me some years ago on the strength of quite other evidences may now, with added force, be repeated; namely, that the use of pottery was in all probability discovered independently in numerous diverse localities, more often, indeed, developed independently by severed tribes, than as a borrowed art; the very identity, almost universally, of at least shore-land varieties of earthenware, so suggestive at first of a common source for it all, proving rather the reverse; that is, that its possession of so many characteristics in common resulted from the action of a uniform and somewhat universally prevailing law, born of the conditions of shore-land environment and developed therefrom in one way and another.

As I have stated once before in the course of these pages, many distinctive inland types of pottery have been experimentally studied by me, many and in some cases all details of process by which they were made having thus been exhaustively worked out, and many of the causes originating these distinctive types having been thereby also apprehended. In a far more thorough manner the evolution of art involved in the development of these types, and, indeed, distinguishing them fully as much as evidences of varied manipulation, have been exhaustively and admirably worked out and set forth by my friend and confrere, Prof. William H. Holmes, in Reports of the Bureau of Ethnology. It therefore remains only for me to state that utilitarian processes growing out of suggestive experiences in the course of the earlier developments I have traced, survivals of other kinds, the mythic and animistic conception of vessels and their functions common to primitive people, and a variety of other influences have affected the development of their varieties of fictile products fully as much as original conditions of production; but one of the surest ways of understanding even these more subtle influences is through experiments with original materials with one's own hands, limited in action to the appliances of the original local stone age conditions in each given case, and in almost blind submission to their influences and promptings.

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RITUAL REGARDED AS THE DRAMATIZATION OF MYTH.

BY WILLIAM WELLS NEWELL.

THERE seem to be good reasons why, in the study of any particular religion, its ritual should be first considered. An act is in itself a more definite thing than a tale. In the worship the celebrant represents, not only his contemporaries, but also probably his predecessors; in the narrative he may represent only himself. The rite is often performed merely as a custom, its original motives being no longer remembered; while the reasons assigned for the performance in such cases are generally not those which brought the ceremony into existence. Many myths are invented simply as explanations of the ritual acts; to use the technical expression, they are etiological.

A consideration of these conditions has of late led some writers to minimize the value of mythology, considered as a key to the significance of the religion with which it is connected. Thus in his excellent work on "The Religion of the Semites" (Edinburgh, 1889) W. Robertson Smith observes:

"In all the antique religions, mythology takes the place of dogma, that is, the sacred lore of priests and people, so far as it does not consist of mere rules for the performance of religious acts, assumes the form of stories about the gods; and these stories afford the only explanation that is offered of the precepts of religion and the prescribed rules of ritual. But, strictly speaking, this mythology was no essential part of ancient religion, for it had no sacred sanction and no binding force on the worshipers .... This being so, it follows that mythology ought not to take the prominent place that is often assigned to it in the scientific study of ancient faiths. So far as myths consist of explanations of ritual, their value is altogether secondary, and it may be affirmed with confidence that in almost every case the myth was derived from the ritual, and not the ritual from the myth; for the ritual was fixed and the myth was variable, the ritual was obligatory and faith in the myth was at the discretion of the worshiper .... The conclusion is that in the study of ancient religions we must begin, not with myth, but with ritual and traditional usage." *

While entirely admitting the correctness of the principle that it is with the worship that the study of religions must begin, it appears

* *Lectures on the Religion of the Semites*, First Series, Edinburgh, 1889, pp. 19, 20.

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to me that the propositions cited contain only part of the truth, and, indeed, exhibit fundamental errors, calculated to interfere with the proper comprehension of the theory of religions. I desire to indicate considerations which incline me to regard myth and ritual as two correlated elements of worship, equally ancient and equally important. A religion is understood only when we become acquainted both with the rites and with the mythic interpretation; in my judgment, disregard of the latter is as fatal as neglect of the former.

In the first place, it is to be remarked that these two constituents of ethnic religion cannot be so easily separated as the author cited appears to assume, and that for a very simple reason: namely, that the myth is an essential part of the ritual.

It may be affirmed with probability that in all gentile or social ceremonies the myth enters into the celebration, and that in one or other of several distinct ways.

First, as part of the ceremonial, the legend may be recited in its full prose form, or chanted as an epos. I have the authority of Dr. J. Walter Fewkes for the assertion that in the secret ceremonies of the Moki snake-dance the priest, in the character of "The Ancient of the Six" (principal directions, *i. e.*, as the representative of the underworld, the source of knowledge), relates the legend of the ancestors of the snake gens, on which the whole rite depends. In the creation myth of the Zunis, according to Mr. F. H. Cushing, the narrative is also recited, the repetition occupying thirty-six hours.

Secondly, the myth may be sung and danced in lyric or ballad form. Although no religious dance songs of a narrative character have come down to us from Greek and Roman antiquity, their existence, and in great number, can hardly be doubted. Of Indian ballads, an Osage example is furnished by J. Owen Dorsey.*

Thirdly, the narrative, when not expressly mentioned, may be presupposed, and referred to in sacred hymns, often of so mystical a character as to be incomprehensible to any person unacquainted with the myth. A striking example is the series of Navajo songs given by Dr. Washington Matthews in his account of the Mountain Chant. Dr. Matthews is my authority for the statement that the creation legend of this tribe, though apparently not the object of a particular religious treatment in ceremonial, is constantly alluded to and supposed to be known. It is scarcely worth while, in the narrow limits of this

* *Sixth Annual Report of the Bureau of Ethnology*, Washington, 1888, p. 381.

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paper, to enlarge upon this use of mythology; perhaps it may be affirmed that ethnic hymnology and psalmody abound in examples, as referring to histories the universal comprehension of which is tacitly assumed.

Not only, however (and this is my special theme), is legend the basis of ritual speech and song, but also of ritual costume and gesture.

It would appear that into many or all social religious rites there enters an element of dramatic representation. The dance or the feast does not consist of a series of arbitrary ceremonies; on the contrary, it is, in some part, a presentation of a sacred history. This principle would seem to make part of all religious ritual, from that of the very lowest existing races to that of the most civilized communities.

If it can be shown that legend, in worships called "primitive," has so important a place, it cannot be true that myth was of secondary importance in ancient religions. It cannot be that mythology had no sacred sanction, or that the performance of the rite was all in all, without reference to the meaning of the rite. On the contrary, in order to obtain a comprehension of any ceremony whatever, it must, in all ages, have been absolutely essential to understand the story on which the ceremony is supposed to depend; and where such story has not been recorded, or imperfectly recorded, then the true character of the rite is not known, or is imperfectly known.

That this is the case in regard to the worships of civilized countries, at the present day, is not disputed. Suppose an observer, acquainted with no more than met the eye, to attempt a description of high mass. How could he understand, from the splendid and highly conventional ritual, that the essence of the whole is the commemoration of the supper in the house of Simon, as well as the repetition of the Passion? The history is essential to the comprehension of the rite, even though the history does not complete the explanation.

Again, if from the supreme function of Christianity we turn to the older rite, of which the Paschal supper is avowedly the modification, what sort of a conception of the Jewish Passover, in its ancient or modern performance, should we obtain from an observer acquainted with the order of the actions, but unable to communicate the history of which the ceremony is understood to be the commemoration?

It would seem that the true relation is not correctly stated by the writer who has been quoted. It is not a dogma, but a narrative,

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on which the ritual of Christianity, as well as of Judaism, is dependent. Mythology in ancient religions does not take the place of dogma in modern faiths; it takes the place of historical narrative in the advanced religions. But, as ancient myths were also presumed to be history, this distinction vanishes.

It is further to be considered that in gentile ceremonial some part of every festival is of true historic import. Not only are the ritual actions assumed to dramatize actual events, but in many ways they do represent such events.

Observations on North American aboriginal religions justify the following generalizations which will probably be accepted by all workers in this field:

1. Tribal, gentile or social religious festivals or "dances" depend, in part, on myths, which are dramatized in the rites. The presentation is usually of a conventional character, rather than theatrical, so that the symbolism is apparent only to the initiated.

2. The rites are performed by secret societies, possessing initiations in different degrees; of the ritual, some portions are intended to be public, while others are wrapt in secrecy; they constitute, that is to say, mysteries. The manner of the celebration, as well as the significance of the rites, is only comprehended by the initiated persons.

3. The dance is performed by masked or costumed personages, who enact the part of the divine beings whose history is recounted in the myths.

To this third principle of American aboriginal worship an important addition is to be made, which, if accepted, will be found to cast a vivid light on the theory of religious observances.

There seem to be good reasons for believing that the actor was originally considered to be identical with the being represented; in other words, that the god in his own person appeared on the stage and performed his own history in dramatic representation.

On the one hand this involved priestcraft; spectators were made to suppose that the personages whom they saw, and whose disguise was assumed in secret, were none other than the veritable deities. On the other hand, the belief was not wholly deception; the priest or medicine man supposed himself, in assuming the dress, to assume also the character, to be under divine possession, to abdicate his own personality, and to present in his thoughts and actions the god whom he represented.

If there were here time to discuss so vast a subject, it might be

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argued that such assumption of foreign personality belongs to the original idea of religious masks. It might be suggested that the oldest of the arts is the sacred drama, in which the actors are divine, and repeat their history before an audience consisting both of gods and men. It might be made likely that after the progress of reflection had forbidden the imagination to be content with the solemn conception of immediate visible contact with personal deities, plastic art was introduced, the god, now regarded as distinct from the priestly celebrant, being supposed to animate the image which constituted his medium of representation. But long after such separation had taken place, and into the historic period of civilized races, the theory of the visible presence continued to survive.

The detailed illustration, by examples taken from American worships, of the principles above set forth is the less necessary because the papers which will be read at this meeting, as well as all the elaborate and interesting researches made during the last few years in the field of American mythology, constitute such illustration.

To argue that the generalizations set forth apply also to all the so-called primitive faiths of other continents, would be to attempt a task for which materials do not yet exist. It may only be affirmed that what is known of Australian or African rituals is no way inconsistent with the supposition that these conditions do represent the theory of the religious usage of uncultured races in general.* It will be enough to suggest, for the sake of urging and directing investigation, that an original feature of early worship is the mystery or sacred dramatic representation; that in such rites the worshipers consider themselves as visited by their divine relatives, who perform before their eyes a representation of the presumed sacred history which constitutes the testimony of the divine existence, and the repetition of which is assumed to be a condition of the divine aid.

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* J. M. Orpen, "A Glimpse into the Mythology of the Maluti Bushmen," *Cape Monthly Magazine*, July, 1874. In answer to questions about creation myths, Orpen was told: "Only the initiated men of the dance know about these things." C. Lumholtz describes festival dances of the natives on the Herbert River, North Queensland. These dances included dressing in a secret chamber, disguise hy false hair and beards, painting, and elaborate pantomime; they lasted six weeks, being performed at night, in the time of the full moon, and were accompanied by fasting. Lumholtz, who appears to have had no conception of the true character of these rites, could only learn that they were connected with "the devil." *Among Cannibals*, London, 1889, p. 239.

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To these suggestions a few words may be added with regard to the place held by myth in the great religions of antiquity.

If, for example, we consider the legend of Osiris, as it appears to have been current in Egypt from very early times, we should find it run, with innumerable variations, somewhat as follows: Osiris, god and king of Upper and Lower Egypt, born in Thebes, is worsted and torn to pieces by his brother Set, dwelling in the Northeastern deserts. Isis, sister and wife of Osiris, lamenting his fate, seeks him with lamentations, gathers up the fragments of his body, and inters them at Abydos, thus rendering herself the pattern of pious devotion to the dead. She bears a child, and, her babe being threatened by the jealousy of Set, flies from Lybia to Egypt. Reaching the marshes of the Nile, in the neighborhood of Chemnis, she hides among the rushes the babe, who is discovered and nursed by the goddess Buto. The young Horus is crowned by the gods, departs on an expedition against the destroyer of his father, and in his turn overcomes and rends the slayer.

The myth, it will be observed, is a version of a story belonging to a class of folk tales which relate the adventures of the son of a slain prince, and describe in what manner the heir is saved from the pursuit of his enemies and taken to a foreign land, from which he at last returns to avenge his father and assume the crown.

Osiris, in ancient texts, is variously represented as the moon or sun, the under-world or the Nile, as a bull or ram, as a sacred plant or the growing corn. But whether an Egyptian considered him as incarnating one or other of these natural objects, no religious person doubted that his history was a real history, that it had occurred in the ancient time, and that it furnished the key to the duty of man and the meaning of life.

As to the antiquity of the myth, it must be considered as implied in the Egyptian ritual for the dead, in which the deceased is represented under the name of Osiris, while Isis and Nepthys appear as mourners. It hardly seems necessary to argue that this method of representation implies the greater age of the mythology; it would never have occurred to any Egyptian to consider Osiris as a type of humanity, unless a legend of his death and burial had generally been known; Isis would not have been taken for the model of a mourner, unless her lamentation for her brother had been familiar; the mystical representation of every funeral as a divine miracle play

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could not have come into vogue, unless the miracle play itself, taken as literal repetition of history, had been regularly performed. It is therefore evident that before the construction of the earliest pyramids there must have existed in Egypt a religious drama, in which a story of Osiris was acted out in song, dance and masked procession.

Concerning the rites of the chief festival of this city, performed at the season of the autumn sowing, Plutarch gives some particulars. An image of a cow, gilt and clothed in a black stole, was displayed during a term of four days, in order to commemorate the lamentation of Isis and her search for the lost body of her husband. On the fifth day of the feast, sacristans and priests carried to the sea, as he says, a wooden chest containing a golden ark, into which was poured drinking-water, while a shout was raised that Osiris had been discovered; then, out of fertile soil mixed with the water, an image was formed, of a luniform character, which was dressed and ornamented.

According to the same author, the vernal festival celebrated the birth and history of Horus, whose victory over Set or Typhon was represented by hewing in pieces a rope. In the same symbolic spirit the cakes manufactured at the time of the feast represented the defeated Set under the image of a bound ass, or indicated the victory of the young Horus by the figure of a falcon striking a hippopotamus.*

These rites, belonging to a period relatively late, may have been affected by philosophic conceptions; but there is no reason to doubt that similar symbolism would have been found in the ritual of an earlier period. Under these circumstances I am quite at a loss to understand in what sense it can be affirmed that the myth was no essential part of the religion. It appears to me that a directly opposite conclusion is indicated. The legends on which so solemn a worship depended certainly did not lack a sacred sanction. Rather each priest and confraternity had an independent version of the history, regarded as the only correct account, and kept with a secrecy proportionate to its assumed consequence.

This particular example is only one case. The worship of Osiris has come into great prominence, and the monuments give fuller accounts of the story and the rites than is the case in other ancient worships; but these rites were by no means singular in respect of their character as mysteries. On the contrary, in all countries of the ancient world every district, every temple had its own mysteries or

* *De Iside et Osiride*, 19, 30, 39, 50, 52.

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sacred dramas, depending on holy legends, jealously kept secret, and presented in testival rites performed by secret societies, by masked or costumed actors. These legends, in consequence of this sanctity, have either not been recorded at all, or preserved only in literary reconstructions, while of Greek or Roman dramatic ceremonial no accurate account has come down.

In what I have said of Egyptian worship I do not mean to assert that the Osirian myth was in all respects older than the accompanying ceremonies. On the contrary, it is very likely that some part of the rites, devised for practical purposes, preceded the myth, which may thus have been explanatory or etiological. This possible early ritual, however, would not have been Osirian religion, as it exists in the monuments; to understand this religion, the story is as essential as the usage. Once more, these hypothetical primitive ceremonies, to judge by analogy, would have had their own mythology, and this would have entered into the representation; the assumption of an original pre-mythic period is unsupported by any observations; there is no reason to suppose that any such stage existed, or that religion, since the birth of religion, has not always consisted of customs accompanied by myths, and of rites symbolizing stories. These histories, and the ceremonial usages with which they are connected, act and react in such manner that it cannot be said that either element is the older; on the contrary, it may always be affirmed with equal truth that myth depends on custom, and that custom is influenced by myth, the two inseparable divisions of worship being equally ancient and equally important.

If there is any correctness in these views, it will follow that a religion is not thoroughly comprehended unless both its ritual and its mythology are known. In the case of ancient religions that knowledge seldom exists. Information, therefore, respecting early Hellenic or Italian religion must be sought from the folk-lore of races which remain in corresponding conditions of culture to those which may be supposed to have prevailed in the beginnings of Hellenic or Italian society. In the formation of such a record of existing ceremonies, it must be considered that the observation of myth is as important as that of ritual. The attempt to effect a separation between these indissoluble parts of worship, to indicate one as primary and the other as secondary, to disregard the intellectual part of religion in comparison with its element of custom, can have no other result than that of confusion and misconception.

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If the conclusions indicated, and which have been set forth chiefly in order to serve as themes for discussion, shall be accepted as of universal application, it will follow that most of the conceptions which have been favored as constituting a proper basis for the classification of religions will be found inadequate, and that the principle of historical continuity will apply to a much fuller extent than has hitherto been assumed.

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SOME ILLUSTRATIONS OF THE CONNECTION BETWEEN MYTH AND CEREMONY.

BY WASHINGTON MATTHEWS.

AMONG the Navajo Indians, as perhaps among all other peoples, rites are connected with myths or with tales which may not be all mythical. This much we can safely aver; but we cannot with equal confidence declare that all rites have originated in myths, or at least in the myths with which we now find them connected. Neither can we affirm that the myth has always preceded the associated ceremony. In some cases a Navajo rite has only one myth pertaining to it. In other cases it has many myths. The relation of the myth to the ceremony is variable. Sometimes it explains nearly everything in the ceremony and gives an account of all the important acts from beginning to end, in the order in which they now occur; at other times it describes the work in a less systematic manner and leaves you to infer that the orderly arrangement may be the result of an afterthought.

Some of the myths seem to tell only of the way in which rites, already established with other tribes were introduced among the Navajos.

The rite-myth never explains all the symbolism of the rite, although it may account for all the important acts. A primitive and underlying symbolism, which probably existed previous to the establishment of the rite, remains unexplained by the myth, as though its existence were taken as a matter of course, and required no explanation. Some explanation of this foundation symbolism may be found in the creation and migration myth or in other early legends of the tribe; but something remains unexplained even by these.

The myths which account for the origin or introduction of rites have each a central figure or hero who may be called the prophet of the rites. In one case there are twin prophets. He leaves his people; wanders among foreign tribes and among the gods, or among divine beings only; learns the rites; returns to his people; communicates his knowledge to one or more disciples, and, having performed his mission, disappears mysteriously. But he does not disappear through

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the portals of death or to the eternal home of ordinary men in the lower world. He is apotheosized. His everlasting home is at least above the surface of the ground if not in the heavens. After his departure he may still manifest himself to the faithful in the form of some natural phenomenon.

In connection with the adventures of this hero, an account of the rites should properly be given; but this is a part of the story which is often omitted. I have obtained rite-myths from Indians both with and without the ceremonial part. I shall briefly state the reasons for this omission. The portion of the myth relating the adventures may be told to any one and may be easily understood and remembered by any one; hence many people who are not priests of the rite may be found who know the narrative portion of the myth only, and are ready to tell it. The ritual or esoteric portion of the myth is usually known only to a priest of the rite, who is rarely inclined to part with this knowledge. Such lore interests only the priest. If a layman, unacquainted with all the work of the rite, should hear the ritual portion of the myth, he would be apt to forget it, having little knowledge of the rite to assist his memory. I have seen in print rite-myths of other tribes in which descriptions of ceremony were obviously omitted.

Probably the most important as well as the most ancient Navajo ceremony now in existence is that of the *kledji qacal*, or night chant. This rite is explained by two principal myths, each of which describes different elements in the long and intricate ceremonial, whose performance occupies nine nights and portions of ten days.

The prophet of the first myth—that of the songs and public dances—was a singular youth who early evinced the gift of second-sight and the possession of magical powers. He seemed to be one favored of the gods and in their confidence. Once, while out hunting, he was seized by certain gods, the Gaaskii—who are represented in Navajo mythology as assuming the form of the mountain sheep—and borne off to a home of the gods in certain cliff-houses in a canon north of the San Juan River, in what is now the State of Colorado. Here he made the acquaintance of the various gods who are now personated in the dances and other acts of the night chant, and he beheld scenes which are to this day depicted in the great dry paintings of this ceremony. He heard, too, numerous sacred songs of the rites and learned them by heart to repeat them to his disciples on his return to his home. While the myth describes the acts of these gods, it does not describe the gods themselves. They seem to have been well-

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known characters before the prophet went on his journey, and we must depend on separate accounts from the lips of learned shamans in order to discover the appearance and attributes of these mysterious beings. But this prophet was not a sick man. He was not treated by the gods for disease. If we would learn how the ceremonies of the night chant may be applied to the cure of disease we must seek the explanation in the second myth.

The prophets of this second myth were characters not unknown to the myth-makers of the Old World. One was crippled, the other was blind. The blind child bore the seeing cripple on his back, and thus they wandered through the land. This unfortunate pair were the fruit of a clandestine alliance between a Navajo woman and one of the gods of the Cañon de Chelly. Their starving relations, on their mother's side, abandoned them in the wilderness to die. They found their way after many vicissitudes to the Cañon de Chelly, where, through the intercession of their father, who long failed to acknowledge them, they were cured of their ailments by means of ceremonies which are described minutely in the myth, and which are practiced to this day. But there are now, at times, variations which the myth does not describe, made in the ceremony.

Out of hundreds of instances in which the specific rules of the ceremony are accounted for by incidents in the myth, I select one for illustration: The cripple and the blind boy were to be treated for their infirmities by means of a hot-air bath in a small lodge, such as the Navajos employ now, prepared for the purpose with many ritual observances. The invalids were charged to say not a word while in the sudatory. When they had been seated there awhile and were perspiring freely, the blind child became conscious that he saw a streak of light stealing in under the corner of the blanket which hung over the opening of the lodge. Forgetting, in his delight, the injunction of the gods, he cried out: "Oh, brother! I can see." At the same moment his crippled brother, beginning to experience the benefit of the bath, shouted aloud: "Oh, brother! I can move my limbs." In an instant the sweat-house, the hot stones, the carpet of leaves, all vanished, and the children, still uncured, were left sitting on the bare ground under the open sky. It was with much difficulty that the gods could be persuaded to build another sudatory and repeat the ceremonies. In consequence of the sad experience of these twins, the strictest silence is, to-day, enjoined on the occupant of the sacred sudatory.

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Both of these myths refer the origin of the ceremonies to people dwelling in cliff-houses. The White House and other buildings still standing in a ruined condition in the Cañon de Chelly are specifically mentioned in the second myth. I think it not improbable that these rites may have been derived from cliff-dwellers, who still occupied the land when the first small vagrant bands of Tinne penetrated to the mountains of New Mexico and Arizona. True, the myth speaks of these cliff-dwellers as gods; but it is not difficult to believe that the rude Athabaskan wanderers, in the days when they subsisted on small mammals, such as prairie dogs, and on the seeds of wild plants (as their legends relate), may have regarded the prosperous agricultural cliff-dwellers as gods. Or it may be that the myth originally referred only to the masked characters in the cliff-dwellers' rites as gods. The Navajos say now that when one of their own number wears the mask of a god and personates a god, he is, for the time being, actually that god. A prayer to a masquerading representative of divinity is a prayer to a god.

But besides these two main myths, there are many more myths belonging to the night chant. The rite contains several groups of songs, and each of these groups has its myth accounting for its origin. Twenty-one divine characters are represented in the rite either by song, by masquerade, or by picture, and each of these characters has its own appropriate myth or myths.

In the myth of the mountain chant,* which I have already published, it is related that a ceremony of somewhat similar character existed prior to the establishment of the mountain chant, and that the rite was only enriched and improved by the prophet. This prophet, according to the story, was taken captive by the Ute Indians. In his escape from captivity he suffered much. His limbs became sore and swollen. Certain mountain gods, who were friendly to the Navajos, and whose dwellings he visited while wandering in his flight through the Carrizo and Tuincha Mountains, took pity on the fugitive, taught him the secrets of their sacrifices and showed him how their aid might be sought. The sacrifices and prayers of this rite are directed, with a poetic consistency and completeness, to the natural phenomena which occur in, and the animals which inhabit, the high mountains. The myth does not describe the acts of the rite in their consecutive order;

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* *The Mountain Chant:* A Navajo Ceremony. Fifth Annual Report of the Bureau of Ethnology. Washington, 1888.

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but there is scarcely any act which is not alluded to in the course of the story. A suspicion may be aroused in the mind of the hearer, who accepts this by no means ancient tale as containing something of the truth, that the prophet may have obtained some suggestions of these rites from the Ute Indians while he was captive among them.

The most ingenious and poetic rite-myth which I have obtained is that of the *yoi-qacal*, or chant of beads. This rite is also known as the eagle medicine. It at least claims for itself a totally superhuman origin. The prophet was a veritable Navajo Lazarus. He was very poor, as the Navajos in their legends represent themselves to have been in the ancient days. Unlike other people, the Navajos have no golden age in the past—the present is the happiest period in their history. This pauper lived near one of the ancient pueblos, now in ruins, in the Chaco Cañon, and subsisted on the refuse of pueblo feasts. One day the pueblo people found on the face of a high cliff, in a small cave, an eagle's nest, which could only be reached by lowering a man with a rope over the edge of the precipice. All feared to undertake the task of descending the cliff; so they concluded to bribe the starving Navajo, with promises of abundant food for the rest of his life, to make the dangerous descent. He accepted the offer; but when he was lowered to the mouth of the cave the wind god whispered in his ear and told him that if he spared the eaglets he would meet with a great reward, while, if he stole them and delivered them to the people of the Chaco, the latter would soon forget their promises and leave him to starve as before. Hearing this, he disengaged himself from the rope and crept into the cave. In vain did the people of the pueblo plead with him and call him endearing names and renew all their promises; he heeded them not, and after a while they abandoned their efforts and went home. Later the grateful eagles (who are represented as men dressed in the feathered robes of eagles) took him out of the cave and flew with him upwards. They bore him through the sky-hole and up to the pueblo of the eagle-people above the sky. Here the prophet performed other valuable services for the eagle-people, and in return for his good deeds he was initiated into the ceremonies of the eagles.

A careful examination of the rites and rite-myths of the Navajos seems to reveal that some of them are not of very ancient origin, or at least have not been long known to the tribe, and we possess traditional evidence that, while new rites are being introduced, old rites are being abandoned. There are reasons for believing that suggestions

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for rites or parts of rites have been obtained from other tribes; but, if this is the case, such rites have been modified to conform to the fundamental rules of Navajo symbolism before being adopted. Some rites, as in one example given, appear to be but modifications of older ceremonies. The prophet of the new did not "come to destroy, but to fulfill." In the histories of other Indian tribes we find many instances of the introduction of new ceremonies in recent times.

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THE FALL OF HOCHELAGA.

A Study of Popular Tradition.

BY HORATIO HALE.

WHEN, in the early autumn of 1535, the intrepid explorer Jacques Cartier, with his little flotilla, recalling in number and dimensions the caravels of Columbus, made his doubtful and hazardous way up the great stream which his native guides knew as the River of Hochelaga, but which he renamed the St. Lawrence, he found the lands through which he passed occupied by tribes belonging to two distinct ethnic groups. These have been commonly known as the Algonkin (or Algonquin) and the Huron-Iroquois families. The latest scientific nomenclature makes them the Algonquian and Iroquoian stocks. But, for the purpose of the present paper, it seems advisable to retain the older designations.

From his guides, who were two Indians of the Huron-Iroquois race that had accompanied him to France from an earlier voyage to the St. Lawrence Gulf, he learned that the regions along the river, on both sides, from its mouth as far inland apparently as their knowledge extended, belonged, according to the native notions, to three separate provinces or "lands" (*terres*). Nearest the Gulf was the land of Saguenay, deriving its name from the great tributary stream which unites with the St. Lawrence about a hundred miles below Quebec. This territory was occupied, then as subsequently, by scattered bands of the Algonkin stock. Next came the province of "Canada" proper, that is to say, the land of the "Town," for such is the well-known meaning of *Canada* in the Iroquoian language and all the allied idioms. This town was Stadaconé, a native village which stood near the site of what is now Quebec. It was the capital or chief abode of Donnacona, the Great Lord (*Agoubana*) of the province. He himself, as his title indicates, was of the Huron-Iroquois stock, though his people seem to have been in part of the Algonkin family. But he and they were alike subject to a much mightier ruler, the great King and Lord (*Roy et Seigneur*) of HOCHELAGA.

This densely peopled and strongly fortified town, which occupied the site of what is now Montreal, was visited by Cartier, who

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has left us a vivid description of the place and its inhabitants. The path by which he approached it from the river led through a beautiful plain, shaded at first by a forest of stately oaks, to which succeeded large and well-cultivated fields of maize. In the midst of these plains, rising near the foot of a lofty eminence, which Cartier named the "Royal Mount" (*Mont Royal*, now abridged to Montreal), the civic fortress presented the towering and formidable front which caused the early settlers of Northern New York to give to the similar strongholds of their Iroquoian neighbors the name of "castles." The enclosing wall was composed of a triple row of tree-trunks, shaped and planted as palisades, and rising to the height of two lances' length. The middle row was upright; the inner and outer rows, inclining to this, were crossed at the top, and braced by horizontal beams, thus forming galleries, whence missiles could be showered upon an assailing force. Within the enclosure were fifty spacious houses, or rather barracks, some of them fifty yards long by fifteen in width, framed of wood, and covered with sheets of bark. Each house, divided into compartments, was the abode of several families; and the whole population probably comprised between two and three thousand persons. But this number did not really indicate the defensive force which the ruler had at his command. The occupants of the fortress were merely a local garrison, which in case of need could soon be largely recruited from the neighboring country. For Hochelaga, as we learn from Cartier, was the capital of a considerable empire, embracing, besides the "Canadians" of Stadaconé, "eight or nine other peoples along the great river."

In 1543, France, disturbed by civil commotions, withdrew from North America, and all efforts at exploration were intermitted. For nearly sixty years the names of those strange northern chiefdoms which Cartier had disclosed to the world remained unmentioned. It was not until 1598 that the Marquis de la Roche, a nobleman of Brittany, at length obtained from Henry IV. authority to resume the colonization of New France, and received with this authority the grandiloquent title of "Lieutenant-General of Canada, *Hochelaga*, Newfoundland, Labrador, and the countries adjacent." But five years later, when Champlain, who was to be the actual founder, made his way up the St. Lawrence to the seat of his future colony, he found, to his surprise, that Hochelaga, along with Stadaconé and its other subject towns, had disappeared entirely, leaving no trace of their existence. A few wandering Algonkins occupied, but hardly

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pretended to possess, the country which had been the seat of this lost empire. They and their Huron allies from the Georgian Bay lived in a state of constant warfare with the confederate Iroquoian nations, who held nearly the whole southern shore of the St. Lawrence and Lake Ontario, and kept the tribes along the northern coast of that river and lake in perpetual alarm. It is natural to inquire what had become of the great Hochelagan dominion, which had so strangely vanished and had been replaced, as it seemed, by a still more formidable power on the southern side of the dividing waters.

This is a question with which many historians, from Charlevoix to Parkman, have dealt, but to which no decisive answer has thus far been returned. It is evidently a question of no small importance, historical as well as ethnological, for it concerns the leading cause of the failure or success of French and British colonization in America. If, after the lapse of more than three centuries, we can succeed in answering it, there may be good hope of solving hereafter some other still more interesting and perplexing problems, such, for example, as the origin and fate of the Mound-builders and Cliff-dwellers, and the source and development of Mexican and Mayan civilization.

In the present case the problem, it must be admitted, is comparatively simple. Unless we make the very unlikely supposition that not only were Hochelaga and its subject towns totally destroyed, but their populations completely exterminated, there are only two directions in which we can reasonably look for the offspring of these populations. The survivors either withdrew to the south side of their great river, and there united with, or, as some suppose, actually became the Iroquois nations,or else they retired to the west and there joined, or, as some think, wholly composed the Huron tribes whom Champlain found near the Georgian Bay. The question is thus narrowed down to two points: Firstly, to which of these ancient divisions of the Huron-Iroquois family are the Hochelagan people to be traced; and secondly, by what hostile power was the overthrow of their state accomplished?

It might seem that the evidence of language alone should be sufficient to settle the first of these points. We have two vocabularies left us by Cartier, containing many of the common words by which the affiliations of language are determined. But unfortunately all that they enable us to prove is that the people of Cartier's "Land and Kingdom of Hochelaga and Canada" spoke a dialect of the Huron-Iroquois stock. Every attempt to find a specially close connection

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between this dialect and that of any other known branch of the stock has thus far proved a failure. The imperfections of Cartier's orthography and the changes of time are quite sufficient to account for this result.

In the absence of other evidence we have to fall back upon that of tradition. It is only of late years, and especially since folk-lore has become a science, and is studied as such in connection with its sister science of comparative philology, that the value of this evidence has been fully understood. In the present case it has been found decisive. Several years ago, while engaged in studying the languages and history of the Canadian tribes, I visited the Wyandots of Anderdon on the Detroit River, the last feeble remnant of the only tribe which retained in Canada the speech of the once famous and powerful Huron people. This ill-fated people, crushed by the Iroquois in the desperate struggle of which Parkman in his volume on "The Jesuits in North America" has given us a narrative of singular interest, fled at first to the far West and took refuge for a time among their Algonquin friends, the Ojibwas, on the shores and islands of Lakes Michigan and Superior. After a time, returning gradually eastward, they made their principal abode for a term on the island of Michilimackinac. Thence, at a later day, descending through Lakes Huron and St. Clair, they took possession of the fertile plains on both sides of the Detroit River, where the guns of Fort Pontchartrain and the presence of friendly Algonquin bands—Ojibwas, Ottawas, and others —gave them hope of security against their persistent Iroquois enemies. The same distinguished historian, in his "Conspiracy of Pontiac," has described the remarkable predominance which the intellectual superiority of this people, even in their reduced condition, enabled them to maintain over the surrounding tribes.

Finally, about the middle of the present century, the majority of the Wyandots, on both sides of the Detroit River, decided to remove to the southwest, under the auspices of the American Government. There in the Indian Territory, and, singularly enough, on a tract directly adjoining the abode of an emigrant band of their ancient enemies, the Senecas, they have found what they may well hope to be a final refuge. It is interesting to know, as an evidence of their strongly conservative character, that, after so many wanderings and vicissitudes, they retain their ancient civic polity with so much vigor that Major Powell has been enabled, in "A Study of Wyandot Government," to reveal fully this remarkable system, and to clear up

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many mysteries which the intelligent and well-educated Franciscan and Jesuit missionaries, living in the Huron towns nearly three centuries ago, did not fully comprehend.

A small number of the Wyandots, not exceeding seventy, but including a few persons of superior capacity, clung to their Canadian homes and remained on what was known as the Anderdon Reserve. From them, and especially from their chief, an elderly man of noble presence and marked intelligence, much information concerning the history, customs and beliefs of the people and their ancestors was obtained. The chief bore in English the name of Joseph White, and in his own language the somewhat singular appellation of Mandorong, or "Unwilling." The name, which he owed to the fancy of his parents, did not by any means indicate his disposition, which was peculiarly frank and genial. He assured me that the traditions of his people represented them as having dwelt originally in the east, near Quebec. He had once journeyed as far as that city, and had then visited the remnant of the Hurons at Lorette. These had ceased to make use of their ancient language in their ordinary speech, but they had not entirely forgotten it; and they still retained the primitive traditions of their race. They took him, he said, to a mountain, and showed him the opening in its side from which the progenitors of their people emerged when they first "came out of the ground." This notion, which prevails in many countries, is commonly held to be a childish myth, born of a metaphor, through which, as in the case of the ancient Athenians, a people proclaim themselves to be the autochthones of a country. Further inquiry, however, has led to the opinion that the expression, with the resulting myth, has had in many cases another and more intelligible origin. It indicated in the first instance simply that the people believed their ancestors to have come "from below," that is, "from down-stream," or, in the case of an oceanic tribe, "from the leeward." In the present case it probably showed that the Hurons of Quebec believed their progenitors to have ascended the St. Lawrence from an earlier abode nearer the Atlantic coast.

Among other informants whom I consulted in my successive visits to Anderdon were two aged men of considerable ability and some literary attainments—Alexander Clarke, the Government interpreter, and his brother, Peter Dooyentate Clarke. They were sons of an English officer by an Indian mother, and had both received some schooling; but they had spent their lives among the Indians, with

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whose ideas, customs and legends they were thoroughly familiar. From Peter I received a small printed book, of which he claimed to be the author, and doubtless with truth, though he had evidently had the occasional aid of a more practiced hand. It was published, in 1870, by Hunter, Rose & Co., of Toronto, and bore the title of "Origin and Traditional History of the Wyandots, and Sketches of Other Indian Tribes of North America." A careful perusal and some conversation with the author left no doubt that he had done his best to give a fair and correct report of the beliefs which prevailed among his people respecting the events of their troubled history.

To make these clear, it should be explained that the people to whom the French colonists gave, in their dialect, the nickname of Hurons, or "Shock-heads," from their mode of dressing their hair, were known among themselves and to other tribes of the same race as the "Wandat," a word which means simply "of one speech." This name was corrupted by the English to "Wyandot," and has now, except in literature and as a geographical expression, superseded the more euphonious French term. The modern Wyandots are mostly descended from a single Huron tribe, the only one which retained its organization when the confederacy was broken up by the Iroquois. This tribe, which originally dwelt apart from the others, in the hilly region about Nottawassaga Bay, was known to its allies and to the French as the Tionontatés, or "People beyond the Mountains," and more commonly to the traders as "the Tobacco Nation" (*Nation du Petun*), from a choice variety of tobacco which they cultivated and sold. They had still another name, as will be hereafter mentioned. In various respects these Tionontatés bore to the other Huron tribes the same relation which the Caniengas (who are commonly known by the nickname of Mohawks) bore to their fellow "nations" of the Iroquois confederacy. They were deemed the oldest in lineage and the highest in civil rank. Their head-chief surpassed in dignity all other chiefs. Their dialect was the source from which the dialects of all the other tribes of their branch were derived. This linguistic paternity and pre-eminence of the Mohawk speech among the Iroquois dialects had been already made clear to me by a careful comparison of vocabularies and grammars. My inquiries on the Anderdon Reserve brought out equally convincing evidence of the fact that the speech of the Tionontatés was the oldest in form, not only of the Huron dialects, but of all the Huron-Iroquois languages. It alone, with the doubtful exception of the Cherokee (which bears marks of

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being a "mixed language"), has retained a labial articulation, the *m*, which, with all other labials, the remaining idioms of that stock have lost.

Of the persistence of ancient names and beliefs in this Huron sept I found remarkable evidence in a story related to me by Chief Mandorong, and confirmed in a singular and unexpected manner from various other quarters. This story, which may be entitled "The Legend of King Sastaretsi,"* is given in my note-book as follows:

"In very ancient times the Hurons (or Wandat) had a great king, or head-chief, named Sastaretsi. They were then living in the far east, near Quebec, where their forefathers first came out of the ground. The king told them that they must go to the west, in a certain direction, which he pointed out. He warned them, moreover, that this would not be the end of their wanderings. He instructed them that when he died they should make an oaken image resembling him, should clothe it in his attire and place it upright at the head of his grave, looking toward the sunrise. When the sunlight should fall upon it, they would see the image turn and look in the direction in which they were to go.

"King Sastaretsi went with his people in their westward journey as far as Lake Huron and died there. But he had time before his death to draw, on a strip of birch-bark, by way of further guidance, an outline of the course which they were to pursue, to reach the country in which they were finally to dwell. They were to pass southward down Lake Huron, and were to continue on until they came to a place where the water narrowed to a river, and this river then turned and entered another great lake.

"When he died, they fulfilled his commands. They made an image of oak, exactly resembling their dead king, clothed it in his dress of deerskin, adorned the head with plumes and painted the face like the face of a chief. They set up this image at the head of the grave, planting it firmly between two strong pieces of timber, its face turned to the east. All the people then stood silently round it in the early dawn. When the rays of the rising sun shone upon it, they saw the image turn with such power that the strong timbers between which it was planted groaned and trembled as it moved. It stayed at

* This legend was published in the *Magazine of American History* for December, 1883, in an article entitled "A Huron Historical Legend." Some of the explanations which there accompanied it are here also retained.

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length, with its face looking to the south, in the precise direction in which the chief had instructed them to go. Thus his word was fulfilled, and any hesitation which the people had felt about following his injunctions was removed.

"A chosen party, comprising about a dozen of their best warriors, was first sent out in canoes, with the birch-bark map, to follow its tracings and examine the country. They pursued their course down Lake Huron, and through the River and Lake St. Clair, till they came to where the stream narrowed, at what is now Detroit; then advancing further, they came, after a brief course, to the broad expanse of Lake Erie. Returning to the narrow stream at Detroit, they said: 'This is the place which King Sastaretsi meant to be the home of our nation.' Then they went back to their people, who, on hearing their report, all embarked together in their canoes and passed southward down the lake, and finally took up their abode in the country about Detroit, which they were to possess as long as they remained a nation. The image of King Sastaretsi was left standing by his grave in the far north, and perhaps it is there to this day."

It will be observed that in this narrative "King Sastaretsi" is described as leading the Hurons in their migration from the east, and as dying just before their return from the northwest to the vicinity of Lake Erie. The time which elapsed between these two events cannot have been less than a century. This portion of the legend, at first perplexing, is explained in a singular and unexpected manner by a passage in the well-known work ("New Voyages to North America") of the French traveler Baron La Hontan, whose descriptions of New France in the period between the years 1683 and 1694 contain the results of much inquiry and acute observation. "The leader of the nation of Hurons," he tells us, "is called Sastaretsi. The name," he adds, "has been kept up by descent for seven or eight hundred years, and is likely to continue to future ages." This practice of keeping up the name of a chief by succession seems to have been common among the tribes of the Huron-Iroquois stock. The names of the fifty chiefs who formed the Iroquois league have thus been preserved for more than four hundred years. The Sastaretsi who led his people from St. Lawrence to Lake Huron was the predecessor of his namesake whose dying injunctions induced them, after their overthrow and expulsion by the Iroquois, to take refuge about the French forts at Detroit and in Northern Ohio.

It is a curious and noticeable fact, however, that neither the Iro-

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quois nor the French are mentioned in this story, nor is any reason given for either the departure of the Hurons from their original home near Quebec, or for their return from the northwest to the neighborhood of Detroit. The pride of the Indian character refused to admit that their wanderings were determined by any power beyond their own will and the influence of their chief.

The story of the image is probably true in its main incidents, though tradition has added some marvelous details. It was natural that the French, after they had established their forts in Michigan and Ohio, should desire to have the aid of their Indian allies in defending them against the Iroquois and the English. This project would involve the removal of the Hurons from their asylum in the far north to the perilous vicinity of their powerful and dreaded foes. While the leaders might be persuaded, by the arguments and solicitations of their French friends, to take this risk, the majority of the people may have been unwilling to abandon their secure retreat and their cultivated fields. To overcome this hesitation, it would be natural also for the chiefs to employ some artifice. Of this species of management, to which the leading men among the Hurons and Iroquois were wont to resort in dealing with their self-willed but credulous people, many curious and amusing examples are related by the early missionaries. In the present instance it would seem that an appeal was made to the reverence with which the memory of their deceased head-chief was regarded. A rude image of him was set up with much formality and a report was circulated of a death-bed prediction made by him concerning it. Early in the morning after its erection the image was found to have preternaturally changed its position and to be gazing in the direction in which the great chief, in his lifetime, had desired that his people should go. This monition from the dead was effectual, and the emigration at once took place. The legend, as told in after times, assumed naturally a more lively and striking cast; but in its leading outlines it is intelligible and credible enough. Its chief interest, however, resides in the fact that it proves beyond question the existence of a belief among the Wyandots of the present day that their ancestors came to the west, at no very distant period, from the vicinity of Quebec.

Two casual references which are made to this subject in the Jesuit "Relations" deserve to be noticed. In general the missionaries, while describing with much particularity the customs and religious rites of the Indians, and in fact every matter which seemed to have

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any bearing on the work of their conversion, took no pains to record any facts relating to the early history of the tribes. Only a casual allusion apprises us that the former residence of the Hurons near the coast was spoken of among them as a well-known fact. The "Relations" for 1636 contain a full and detailed account of the Huron nation by Brebeuf, an admirable work, from which our knowledge of that people in their primitive state is chiefly drawn. In speaking of their festivities, he ascribes the origin of some of their dances to the teaching of a certain being, "rather a giant than a man," whom the people encountered at the time when they lived by the seaside (*lors qu'ils habitoient sur le bord de la mer*).

The other allusion seems, at the first glance, to bear a different interpretation. It has been quoted by Gallatin and others as affording evidence that the people whom Cartier encountered on the St. Lawrence were Iroquois; but a careful consideration of the facts, in the light of recent information, shows that this inference cannot properly be drawn from it. Father Le Jeune writes from the vicinity of Quebec in 1636: "I have often sailed from Quebec to Three Rivers. The country is fine and very attractive. The Indians showed me some places where the Iroquois formerly cultivated the land." These Indians were of the Algonquin race, and their statement, which we need not question, merely shows that their immediate predecessors in that locality were Iroquois. If, as the traditions of the Hurons affirm, the flight of their ancestors from their eastern abode was caused by the attacks of the Iroquois, we may be certain that these conquerors did not leave the deserted country vacant. Their first proceeding would be to assume possession of it and to plant colonies at favorable points. This was their custom in all their conquests. An Iroquois colony was thus established at Shamokin, now Sunbury, in Pennsylvania, after the Delawares were subdued; and other settlements secured the territories which the confederacy acquired in Northern Ohio. Thus it would seem probable that, after the flight of the Hurons, the Iroquois held their lands along the northern bank of the St. Lawrence for a considerable time. At length, however, the annoyance and loss from the incessant attacks of the surrounding Algonquins became so intolerable as to make these distant outposts not worth keeping. Their abandonment apparently did not long precede the arrival of Champlain, who, as is well known, found the Hurons and the Algonquins united in strict alliance, and engaged in a deadly warfare with the Iroquois.

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On another occasion, Chief Mandorong gave me an account of the origin of the war between the Hurons and the Iroquois which caused his people to leave their eastern abode. The two communities were living near each other, beside the mountain from which their ancestors had issued. They dwelt on opposite sides of the mountain, and apparently of the river, though the latter point was left in some obscurity in the narrative. To prevent differences, the chiefs had forbidden the people of the two tribes to intermarry. An Iroquois warrior at length transgressed this interdict and married a Huron woman. She incurred his anger by some misconduct, and was killed by him. The chiefs of the two tribes held a conference and agreed that, as she seemed to have merited her fate, her husband should go unpunished. This decision, however, did not satisfy her kinsmen. One of them went secretly into the country of the Iroquois and killed a man of that people. Thereupon a war arose between the two nations. Many conflicts took place, in which the Hurons generally had the best. At last, however, by an act of treachery, the Iroquois got possession of the Huron town during a truce, when the men were absent from it, holding a council elsewhere, and killed all the women and children. When the Huron warriors returned and found their wives and children massacred, their grief and wrath knew no bounds. They pursued and overtook the murderers (as the chief affirmed) and slew them to the last man. They then quitted the mountain near Quebec, and scattered themselves over the country. This statement may be taken as sufficient evidence that what they had suffered was really an overwhelming defeat. That this was the belief of the chief was evident from what he immediately added—that there were some families which had not been included in the massacre, having been in the woods, hunting or otherwise engaged at the time; and from them all the Wyandots are descended. He further said that the missionaries were in the country at the time of the final dispersion, though not at the beginning of the war. It was evident that he looked upon the war as a secular strife which began in early times in the far east, and was fought out through many years and successive stages of westward flight and pursuit, until it culminated near Lake Huron in the terrible conflicts witnessed and recorded by the Jesuit missionaries, several of whom perished in its final agonies. If we wish to picture to ourselves the incidents which, at the outset of the war, preceded, accompanied and followed the fall of Hochelaga, we have only to turn to the pages in which Parkman has related the closing scenes of the same contest.

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The traditions preserved by Peter Clarke in his book accord in general with those related to me by Chief Joseph White, differing just enough to show that the two narratives are the independent testimonies of honest reporters. "From traditional accounts," writes Clarke, "the Wyandots once inhabited a country northeastward from the mouth of the St. Lawrence, or somewhere along the Gulf coast, before they ever met with the French or any European adventurers." At a later period, "during the first quarter of the sixteenth century," as he thinks—though his chronology must be conjectural—a rupture took place between the Wyandots and the Iroquois (whom Clarke generally designates by the name of their largest tribe, the Senecas), "while they were peaceably sojourning together, in separate villages, within the vicinity of what is now Montreal." "At this time," he adds, "and back to an unknown period, the Iroquois and Wyandots had always dwelt in the same region, where their abodes and hunting-grounds were conterminous. There are," he says, "conflicting accounts of the cause which led to the quarrel. Some say that it commenced about a Seneca maiden and a chief's son." The wrongs of the maiden led to the assassination of a Seneca chief by a Wyandot warrior. It is a curious fact, and a strong evidence of the truthfulness of the narrative, or at least of the narrators, that both Clarke and White admitted that their own people were in fault at the beginning of the war. The result is told alike in both narratives, but with more particularity by Clarke. The Wyandots "broke up their villages and journeyed westward," until they reached Niagara. Here they remained a considerable time, and then "migrated northward to where the city of Toronto now stands." Thence after a time, in fear of the Iroquois, they retreated still farther to the north, until they reached Lake Huron. Here they found game abundant, and abode for many years. And here they were joined by a band of their own people who had remained on the Ottawa River. These doubtless composed that branch of the Huron nation which had separated from the Tionontatés on the overthrow of the Hochelagan dominion, and had retreated from Montreal up the Ottawa River. It was along this river that Champlain and the French missionaries followed the traces of these fugitives early in the seventeenth century. From this northern refuge on the Georgian Bay, Champlain, with a party of his soldiers, led a Huron army into the region south of Lake Ontario, on an expedition against the Iroquois, which ended disastrously. Had the result been otherwise and the Iroquois been crushed, as the assailants

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expected, the course of North American history would undoubtedly have been widely deflected. The attack of Champlain and his redskin allies was soon terribly avenged by the Iroquois warriors, whose raids broke up the Huron towns and kept back the French settlements for more than a century, while the English colonies were gathering strength.

The flight of the Tionontatés, first to Michilimackinac, and thence to the neighborhood of Detroit, is narrated by Clarke at some length. In connection with the latter movement is mentioned "the last of the ancient line of head-chiefs or kings of pure Wyandot blood, named Suts-tau-ra-tse." He is spoken of as living about the middle of the eighteenth century, and is said to have died at a great age in its last decade. He was probably the grandson of the King Sastaretsi of my friend Mandorong's legend; and there can be little doubt that he was the person who was seen in his boyhood by Charlevoix, when that historian visited Detroit as the guest of the Commandant, Tonti, in 1721. He describes a great meeting of the neighboring tribes, Huron and Algonquin, which was called by the Commandant to receive a message from the Governor. "Sastaretsi," writes Charlevoix, "whom our Frenchmen call the King of the Hurons (and who is in fact the hereditary chief of the Tionontatés, who are the true Hurons), was present. But as he is still a minor, he came merely for the form. His uncle, who governs for him and who is styled the Regent, spoke in his stead, in the quality of the orator of the nation. When a council is held, the honor of speaking for all the tribes is commonly conferred upon the Hurons."

On another occasion this noted name turned up unexpectedly. In obtaining from my Iroquois friends a list of the Indian tribes with which they were acquainted, I received from them two names for the Tionontatés, in addition to the latter name, which was merely a local designation. One of the names was Wanat, the Iroquois form of Wandat; the other was *Sastaretsi*. It is not uncommon for an Indian tribe of the Huron-Iroquois stock to be named from its principal hereditary chief. A common name of the Mohawks was the plural form of the title of their leading chief, Tekarihoken.

An important confirmation of the tradition received from the Anderdon Wyandots is furnished by a high authority. That accomplished ethnologist and careful investigator, the late Sir Daniel Wilson, contributed to the transactions of the Royal Society of Canada for 1884 an admirable paper, entitled "The Huron-Iroquois—A Typical

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Race." This paper is reprinted in his latest volume, "The Lost Atlantis and other Ethnographic Studies," and should be consulted by every student of this interesting subject. He had visited the Hurons of Lorette, near Quebec, already referred to—a small band of some three hundred half-castes, descended from Huron refugees who found an asylum in that quarter after the destruction of their towns in the west by the Iroquois. In referring to the story told me by the Anderdon chief, Joseph White, Sir Daniel Wilson adds: "The late Huron chief, Tahourenche, or Francois Xavier Picard, communicated to me the same legendary tradition of the indigenous origin of his people; telling me, though with a smile, that they came out of the side of a mountain between Quebec and the great sea. He connected this with other incidents, all pointing to a traditional belief that the northern shores of the lower St. Lawrence were the original home of the race; and he spoke of certain ancient events in the history of his people as having occurred when they lived beside the big sea."

All these facts, taken together, seem to lead to conclusions of great importance with regard to the value of traditional evidence. It is plain that until recently this evidence has been seriously undervalued. Our students of history have been too generally a book-worshiping race, unwilling to accept any testimony with regard to ancient events which is not found in some contemporary page, either written or printed. It is not half a century since a distinguished English author, eminent both as a statesman and as a philologist, pronounced the opinion that no tradition can be trusted which is more than a hundred years old. At the time when this opinion was put forth by Sir George C. Lewis, many voyagers and missionaries in the Pacific Islands were accumulating traditional testimony of vast extent and varied origin, which is now admitted on all hands to prove the occurrence of events that must have taken place at successive periods extending over the last two thousand years. The "Brief History of the Hawaiian People," by Prof. W. D. Alexander of Honolulu, published in 1891 "by order of the Board of Education of the Hawaiian Kingdom," recounts as unquestionable facts many voyages, migrations, battles, royal and priestly accessions, marriages and deaths which have occurred in the Sandwich Islands and other groups, from the eleventh century to our own time. At the other extremity of the great ocean, the "Polynesian Society," established at Wellington, New Zealand, has published in its excellent quarterly journal communications from able contributors relating to various island histories,

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and carrying these back, with the aid of numerous mutually confirmatory genealogies, for many centuries, with unhesitating belief in their general truth. In this way the history of the peopling of the vast Polynesian region, extending over a space larger than North America, and covering at least twenty centuries, is gradually becoming known to us as surely, if not as minutely, as that of the countries of Europe during the same period.

The question naturally arises whether we may not hope to recover the history of aboriginal America for at least the same length of time. The facts now recorded will show that the few dispersed members of the Huron-Iroquois stock retain to this day, after many wanderings, clear traditions of a time, which cannot have been less than four centuries ago, when their ancestors dwelt on the northern coast of the St. Lawrence Gulf. The historical traditions of the Delawares, retained in memory by their famous Picture Record, styled the *Walam Olum*, or Red Score, which has been carefully published and admirably elucidated by Dr. Brinton in his volume, "The Lenape and their Legends," seem to go back for more than thrice that period. And the conclusions derived from these sources have been lately confirmed and enlarged by a series of important investigations relating to almost every branch of the fifty-eight aboriginal stocks which have been found to exist between Mexico and the Arctic Ocean. In these studies, in which, besides the names already mentioned, those of many members of the Bureau of Ethnology, the Peabody Museum, the Hemenway Expedition, the Royal Society of Canada and its affiliated associations, the American Antiquarian Society, the American Folk-lore Society, and several Historical Societies, have been honorably conspicuous, we have the gratifying earnest of future gains to historical and ethnological science which are to be expected from this source. We have every reason to feel assured that in the three hundred Indian reservations and recognized bands of the United States and Canada, with populations varying from less than a hundred to more than twenty thousand, and comprising now many men and women of good education and superior intelligence, there are mines of traditional lore, ready to yield returns of inestimable value to well-qualified and sympathetic explorers.

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FOLK-LORE OF PRECIOUS STONES.

BY GEORGE FREDERICK KUNZ.

WEARING and carrying charms is a form of superstition which undoubtedly existed in the earliest times, originating with primitive man, perhaps, as soon as he wore his first ornament, and the habit is still persistently clung to by men and women who would scoff at the idea that they were at all superstitious. This tendency is strikingly shown by the estimation in which is held one of the most beautiful of all gems—the opal—which is often not selected as a gift, not perhaps because the giver really believes that it would bring ill luck, but certainly because he would feel that his lack of superstition might be held answerable by others for any harm that should befall the loved one to whom he would give it. Yet the same person would offer as a gift the moonstone or a natal stone to insure to the wearer the benefits supposed to be derived from their possession.

The use of the quaint amulets was well illustrated by the remarkable series of charms consisting of arrow-points, sharks' and boars' teeth, and various odd and curious things, used in Italy and France for many preceding centuries, shown by Belucci, of Genoa, at the Paris Exposition of 1889.

Until the beginning of the present century, and even to-day in Italy, arrow-points made by primeval man have been known as fairy darts, and worn as amulets or charms. The celts and stone hammers, strange to say, were called *pierres du foudre*, thunderbolts. The crystals of staurolite that are found in Brittany were believed to have fallen from the sky, and to them were attributed certain powers to charm.

In early times, and as late as the seventeenth and eighteenth centuries, it was believed that there was a stone either in the head or in the stomach of nearly every animal. When in the head, these were evidently hard concretions of bone; when in the stomach of herbivorous animals, calcareous concretions, generally having for a nucleus hair or some other indigestible substance. The stone from the head of the dragon was called Draconius; the Greeks and Romans called

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that from the eagle Aetites; that from the kidneys of cervicapra, an antelope of Arabia, was called Bezoar, and was believed to consist of the poison of serpents and to be a potent charm against poison, the dragon, etc.,—and to all these stones was ascribed marvelous power to charm and to cure. This superstition was prevalent in Asia as well as throughout Europe.

Much valuable and interesting information has been drawn from the folk-lore and superstitions of the East Indians by Mohun Souhindro, the Maharajah of Jagore, in the two volumes of his "Mani Mali," or "Necklace of Gems;" from Europe, by the late Rev. C. W. King, in his "Engraved Gems," "Antique Gems," "Precious Stones and Metals," etc.; and by William Jones, in his "History and Mystery of Precious Stones," "Finger-Ring Lore, Credulities and Superstitions,' etc. We are informed also as to the notions regarding precious stones by many ancient writers, among others—

Theophrastus and Aristotle, Greek philosophers, of four centuries before Christ.

Pliny, the Roman author of the first century.

Avicenna, the Arabian philosopher of the tenth century.

Marbodeus, of the eleventh century.

Albertus Magnus, the learned German Bishop of Ratisbon, in the thirteenth century.

Leonardus Camillus, an Italian physician, in the fifteenth and sixteenth centuries.

Boetius de Boot, the court physician of August II. of Saxony, of the seventeenth century.

Thomas Nichols, professor at Jesus College, Cambridge, 1650.

Ernestus Bruckman, a German physician, 1770, at the court of the Duke of Brunswick.

Each precious stone was supposed to have special medicinal powers; and the pharmacopœia of the ancients had, among its most potent remedies, a very costly compound called the "Five Precious Fragments," supposed to consist of powdered ruby, topaz, emerald, sapphire and hyacinth. As their patients were not likely, nor competent, to analyze the mixture, it may have happened that the physicians pocketed the real gems, as well as the fee, using other substances in their place.

This faith in the virtue of certain precious stones for the cure of diseases was held to a comparatively late period and prevails somewhat even yet.

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The earliest known objects made of rock-crystal, hematite, jasper, and other materials deemed valuable at the time, are undoubtedly the curious rolling Babylonian cylinders on which were engraved seals and records. These date back with a certainty to 2800 B. C., and come down to nearly the beginning of our era; the conoid seals, from 1000 B.C. to after the Christian era. The ancient Egyptians carved out of hard stone from over 2000.B.C. The use of these as intaglios reached their greatest perfection during the highest period of art in Greece and Rome, from about 5 B.C. to the second century after Christ; in Rome, then degenerating in artistic spirit, until the fifth century of our era, when the Gnostics and others re-engraved the backs and frequently the faces of their antique gems with their mystic and often apparently meaningless inscriptions. After this time, during the period of Venetian commercial supremacy, and during the Crusades, the beads of precious stones from the Orient were disseminated throughout Europe. The table-cut stones date from the fourteenth to the seventeenth centuries, when the rose-cut and brilliant-cut stones made their appearance, simultaneously with the introduction of which superstition seemed to wane. These various forms of cutting as well as the savage forms will be found in the collection * exhibited by me for the New York branch of the American Folk-Lore Society in the Department of Ethnology, which contains a few of the more interesting objects that it has been my good fortune to obtain, and with it a collection of the more important literature that has appeared since the fifteenth century, among which we have editions of Aristotle, Pliny, etc., ending with what may seem remarkable at the present time, a prospectus of a work on the medicinal properties of precious stones by Dr. de Lignieres, of Nice, who has a volume of 641 pages in press that will treat of this subject. In this work the Doctor seriously discusses the medicinal virtues of various precious stones.

The star sapphire (asteria)—one set in a ring with Persian mounting—was supposed in the seventeenth century to bring good fortune to him who wore it; called Slegstein by the Dutch. It is also said to have been good for apoplexy. Captain Burton, the great oriental traveler, had a star sapphire which he always carried with him, and in the heart of Arabia, or on the deserts of Africa, the sight of the gem always inspired respect akin to reverence. It proved to

* At the Columbian Exposition.

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him a talisman of unexampled power which the people believed would render him all possible assistance in case they incurred his vengeance.

Cat's-eye, chrysoberyl; Ceylon; used by the natives as a charm against evil spirits and believed to bring good luck.*

Moonstone from Kandy, Ceylon; believed to bring good fortune and considered holy. Never sold on any other than yellow cloth, the sacred color. Supposed in the seventeenth century to be a cure for epilepsy and also to make trees fruitful. Of special lunar attraction. It daily waxes and wanes according to the moon's state. It was a very sacred stone and contains an image of the moon, which grows very clear upon fortunate days and occasions and the reverse under evil influences. A stone of warning and friendship; cures epilepsy; makes trees fruitful. Called a "sacred" stone.

Lodestone; native magnet; bound with brass and soft iron to preserve its strength. The property of an European physician in the fifteenth or sixteenth century. In the seventeenth century lodestone was used as a remedy for headaches, convulsions, as an antidote for poisons; supposed to produce love and concord, to drive away fear and render the wearer invisible. In the East Indies it is said that the king should have a seat of lodestone at his coronation.

Lodestone, a native oxide of iron having magnetic properties. Worn for centuries for the power it was supposed to possess and for the charm it was believed to give the wearer. Large quantities of it are found at Magnet Cove, Arkansas. It is estimated that from one to three tons are sold annually to the negroes, to be used by the voodoos, who employ it as a conjuring stone. In July, 1887, an interesting case was tried in Macon, Georgia, where a negro woman sued a conjurer to recover five dollars which she had paid him for a piece to serve as a charm to bring back her wandering husband. As the market value of this was only seventy-five cents a pound, the judge ordered the money refunded. A very strong natural mass found at Magnet Cove, Ark.

Hydrophane (magic stone); is quite remarkable for its power of absorbing liquid. When water is allowed to drop slowly on it, it first becomes white and chalky and then gradually perfectly transparent. This property is so strikingly developed that the finder has suggested

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* See *Notes on Alexandrite, Aqua Marine and Chrysoberyl*, Trans. N. Y. Acad of Sciences, Vol. V., No. 6.

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its use in rings, lockets, charms, etc., to conceal photographs, hair, or other objects which the wearer wishes to reveal only when his caprice dictates; evidently the *Occulis Mundi* of the gem writers of the fifteenth to eighteenth century.*

Tabasheer, a vegetable opal that forms in the joints of the bamboo; purchased at the bazaar held in Calcutta, Hindostan, 1888; used in India for medicinal properties and suggested by the exhibitor, George F. Kunz, to have been the snake stone mentioned by Tavernier as possessing the power of neutralizing the poison of the cobra di capello.

Floating stones, found in a branch of Mann Creek, a tributary of the Weiser River, which flows into it near its confluence with the Snake River in Idaho. The so-called floating stones are hollow quartz geodes, with a shell so thin that the air in the cavity more than makes up for the specific gravity of the quartz.

Madstone (aluminous shale) from Western North Carolina; one of many made of similar material. They were formerly and are still believed to possess the power of drawing poison out of wounds produced by the bite of a dog or the sting of a snake.

Eye-agate; natural color; from Persia; one pear-shaped stone 2½ inches; one round, thick piece; one a double eye set; called Aleppo stone, because believed to be efficacious in driving away Aleppo sores, ugly sores which form on the nose and face; from Aleppo, Persia.

Moss-agate; gray green with black and brown markings; from Babylon; set in silver; ring.

Rainbow agate (Chalcedonix); when this is held perpendicularly and a fixed light is viewed through the stone, it shows a rainbow-like color.

Amber. The tears of Electrides; of great electric and medicinal value when worn in beads about the neck and pulse; cures sore throat, ague; charms away insanity, the asthma, dropsy, tooth-ache; and drives away snakes. A specific against deafness; good for the eyesight when ground up with honey. Oil of amber, or amber dissolved in spirits of wine, soothes and allays pain; also supposed to be the tears of birds of Meleagrides, who weep for their brother Meleager; said to be a concentration of birds' tears.

> "Around thee shall glisten the loveliest amber
> That ever the sorrowing sea-bird hath wept."—*Moore.*

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* See descriptions by George F. Kunz, *American Journal of Science*, 3d series, Vol. XXVIII., December. 1887; and *Science*, Vol. XVIII., No. 459.

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String of sixty-one amber beads, with silver clasp (very old), worn by a peasant in Northern Prussia. Evidently given as a wedding present and worn for centuries. The string indicates having been worn for some time.

Amber beads, over one inch in diameter, (very old), crudely cut and faceted. Original made in Konigsberg, Prussia. Worn by a chief in Northern Africa.

Amber charm; oval; drilled; carved in intaglio and leaves; Italian; eighteenth century; worn as a charm.

Amber ornament containing fragment of a leaf; carved; quaint leaf-like form; from Japan.

Staurolite (cross-stone); Fannin County, Georgia; worn in Brittany, France, as a charm. The local legends state that the stone dropped from the heavens.

Chiastolite (macle); Lancaster, Mass.; worn in Switzerland for the charm the cross-like marking is supposed to bring the wearer.

Flint nodule; broken open; each side alike; from the coast of Brittany; containing a staining resembling a shrouded figure; worn as charms in the eighteenth century and known as portrait stones.

Amulet of fossil shark's tooth; mounted in silver; found in excavations at Salzburg, Austria; seventeenth century.

Two arrow-points; from Northern France; called "fairy darts" in the sixteenth to eighteenth century.

Celt; Brittany, France; called *pierre du foudre*, or thunderbolt.

Meteorite; mounted as a charm; said by an ancient writer to "preserve the wearer from all harm, even though he be surrounded by enemies."

Jade; human tooth inlaid with lettuce-green jadeite; found by Mrs. Mary Robinson Wright with three other teeth similarly inlaid, in a tomb four feet in depth, in Tacamaca, near Gualajaia, State of Jalisco.

Jade; small fragment taken from the tomb of Tamerlane at Samarkand, Central Asia. The vandal who broke this off left the balance for some enterprising English or American collector.

Earring of jade (Oceanic variety) from New Zealand; made at Oberstein to imitate the earrings worn by the Maoris of New Zealand.

Jadeite; two beads; one circular cup-shaped ornament, drilled and with circular hole in the bottom; one small fragment of a celt showing former drilling; from Valley of Mexico, Mexico.

Jade (and jadeite); was worn in the fifteenth century and later as

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a cure for kidney disease; hence its name, Spanish *bijada* and Greek *nephros.*

Jadeite ornament; one-quarter of a celt which had been previously decorated; drilled on one side to be worn as a pendant; Valley of Mexico, Mexico.

Jade; East Indian; pipe top; originally set with jewels; found in Persia; evidently brought to Persia in the loot of India by Nadir Shah.

A cast of the Kunz votive adze now in the Kunz collection in the American Museum of Natural History, New York, N. Y. This object, weighing nearly sixteen pounds, was found in Oxaca, Mexico, and is believed to be the largest known aboriginal object made of jadeite. Two fragments have been cut from the back in prehistoric times for the purpose of extending the material. (See article on jadeite celt.)

Chloromelanite pendant; originally a whole celt of which this is only about one-half; part of the decoration still visible; Valley of Mexico, Mexico.

Cabot stones from the head of the fresh-water "sheepshead," a fish allied to the drumfish, the stones from the head of which were known by the name of "cabot," and were said to prophesy storms when cloudy, and favorable weather when bright and shiny. Usually found in pairs, peculiarly marked. A lucky stone. Presented to the author by Eugene Blackford of New York.

Eye-stones or ophthalme; are taken from the crawfish in the Sandwich Islands. They have been used from time immemorial for removing dust or other particles from the eye.

Aetites; a stone found in the nest of the eagle; eagle-stone; believed to give the strength of the eagle; fruitfulness; was greatly valued when genuine. When it was scarlet in color it rendered its owner rich and amiable and preserved him from all casualties.

Amber amulet; very ancient; decrepitated through age; found in a cave on the Baltic coast.

Amber ornament; pierced from both sides and ornamented; very old; from Northern Africa.

Alectorius; a quartz pebble taken from the gizzard of a fowl; sacred to athletes; a stone of this kind is said to have been worn by Milo the wrestler.

Beza or bezor stone; taken from the kidneys of the Cervicabra, wild Arabian deer. A potent charm against poisons and plagues; good for gout; in great repute among the ancients, bringing fabulous

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prices in India and in the days of Elizabeth and James I. It was believed that it must be set in silver.

Cockstone; a crystal about the size of a bean; extracted from a cock; renders the possessor invisible and prevents thirst.

Coral hand; was supposed in the seventeenth century to show by its change of color the approach of disease; was also worn as an amulet for protection against enchantments, poisons, thunder, tempests, etc. In the East Indies the deep red coral was supposed to bring prosperity to its owner.

Coral; small branch with two small bands; Naples, Italy. Worn to ward off the evil eye; also believed to possess great phallic power.

Coral bead; very rude; west coast of Africa.

Pendant made of rich blue *lapis-lazuli;* drilled at the side; Turkestan, Asia.

Malachite; used in the seventeenth century to protect children from danger and disease; also as an amulet to shield the wearer from the attacks of evil spirits.

Four carved steatite talismans; three green with emblematic inscriptions; Persian; modern.

Milargro (miracle); made of silver; used in Peru by the poor, who wear them on the affected part to cure or to ward off disease. (E. E. Olcott, Lima, Peru.)

Jet carving; old Mexican; reproduction of a Spanish caravel.

Sioux peace pipe of catlinite from Pipestone County, Minnesota.

Six pendants made of argonitel; used as charms by the Santa Domingo Pueblo Indians, of New Mexico.

Selenite; cleavage 5x3 inches; used as a window in a pueblo of the Santo Domingo Indian Reservation, New Mexico; taken out by George F. Kunz, August 4, 1890.

Arrow-points; rock crystal; from Waynesville, Georgia.

Arrow-points; rock crystal; from Alexander County, North Carolina.

Gold bead; pre-Columbian; from Orlando, Florida.

Two ornaments; one hemispherical; the other drilled; made of barite; found in Indian mounds near Lexington, Kentucky.

Arrow-points; obsidian, agate, and opalized and yellow agatized wood; from Oregon City, Willamette River, Oregon.

Shells of Anadon containing small figures of Buddha and a string of beads, all of which have been inserted between the shell and the mantle of the mollusk by priests in Central China, who introduce

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these objects for the purpose of illustrating their power in oppressing the laity.

Pearls taken from the altar of Till Porter Mound, Little Miami Valley, Ohio, by Professor F. W. Putnam. These pearls were originally taken from fresh-water mussels (Unios) of the Miami and adjacent rivers, were drilled and worn as ornaments and were evidently thrown at the time into the fire on the altar of the mound, in commemoration of some great event.

Mummy eye; an eye taken from the eye of a mummy at Cusco, Peru; originally the eye of the giant cuttlefish (*loligo gigas*); taken from the fish by the ancient Peruvians and put in the eyes of their mummies, as they were more durable. (See *Trans. N. Y. Microscopical Soc.*, October 2, 1885.)

Abalona shells; two oval drilled pendants from the Indians of Santo Domingo pueblo, New Mexico. The abalona shell (*haliotis*) is used for ornaments and for decoration in the form of inlays by the Indians of the entire western coast from Alaska to California, including the outlying islands.

Carbuncle. The third stone in the high priest's breast-plate; engraved Zebulum. Sacred to Angel Amriel; light; endowment; guidance; martyrdom; Passion of the Savior; zodiacal sign; constellation. Called Osculan and Chrysolampis. Believed to be the ancient name for garnet (Dana). The Sixth Heaven is composed of it, according to the Koran. Dragons' eyes were of carbuncle; had a special virtue by which it emits a wonderful light which will light a room at night.

String of sixty rude garnet beads without any fastening; drilled from both sides; from ancient Bohemian graves.

Button; small ornament made of bronze containing an encabochon; rose-colored tourmaline (Rubellite), from the State of Mainboung, China; set in a metal border of blue feathers from the kingfisher bird. The red tourmaline is called *oxi* by the Chinese and is greatly esteemed for the properties which it is supposed to possess.

Rock crystal amulet; mounted in silver; engraved with the arms and once the property of Count von Walstein, Archbishop of Prague, Bohemia, 1683.

Rock crystal amulet; mounted in silver; engraved with the arms and once the property of Count Eggenberg, Duke of Bohmisch Krumlow, Bohemia; seventeenth century.

Two tablet-shaped rock crystal seals with inscriptions; early Persian.

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Rock crystal *encabochon* with inscription; early Persian.

Rock crystal ornament; cone-shaped; drilled; fastened to a cylindrical jadeite bead; originally used as a pendant from a necklace. Valley of Mexico, Mexico.

Rock crystal labret (lip ornament); made of rock crystal with metallic (silver) border at lower end for the shield; Valley of Mexico, Mexico.

Rock crystal ball; from a grave in ancient Brittany; used for divination in the middle ages.

Rock crystal ball; Japan.

Rock crystal was used in the seventeenth century as a remedy for gout, swoons and headaches. In the East Indies it is supposed to secure the wearer against the attacks of thieves and wild beasts, and as an antidote to poisons. In Europe it was believed to protect the sleeper from bad dreams, to dissolve witchcraft and spells. It was used in divination, as a hypnotic stone, and to induce mesmerism; was much used by the old astrologers, who believed in it; sacred to Diana, Luna, etc.

Rock crystal ball, used in divination by sightseers and others, notably by Dr. Dee and others of his time; apparently in early times, as such balls have been found in old graves in Brittany and England.

Obsidian chipped ornament; semi-circular; crescent-shaped; three inches in length; drilled at both ends; from Valley of Mexico, Mexico.

Two ear ornaments; obsidian; circular; partly finished; from the Valley of Mexico, Mexico.

Ornament of obsidian; duck's head with flat bill; carved; drilled; to be used as a pendant, with small hemispherical discs of rock crystal for the eyes; from the Valley of Mexico, Mexico.

Unfinished ear ornament; obsidian; from Valley of Bravo ve Temaxcaltepec, State of Mexico.

Labrets; Aztec lip ornaments, made of obsidian; from the Valley of Mexico.

Arrow points of obsidian and chalcedony; worn drilled; to be suspended as ornaments. Two with original thongs to hold them together. Worn as fetiches by the Isleta Indians, New Mexico.

Lava dishes containing small fragments of chalcedony, turquoise, obsidian, etc., as they are offered for sale by the Indians of the Santo Domingo pueblo, New Mexico.

Silver charm ring containing turquoise set in copper. This ring was made by the Navajo Indians.

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Turquoise amulet, large flat, mill-drilled; used as a charm by the Indians of the Santo Domingo pueblo, near Wallace, New Mexico; obtained near Los Cerrillos.

Turquoise earrings; turquoise beads on silver wires; from the pueblo of San Domingo, near Wallace, New Mexico.

String of beads and a small animal fetich, made of marine shells, to which are attached drilled ornaments of turquoise and steatite from an ancient Zuni grave near Tempe, Arizona.

Persian turquoise talismans and ring, with inscriptions from the Koran.

Fetich from pueblo of Santo Domingo, New Mexico; prairie dog; made of gypsum with eyes of turquoise; used by the medicine men of the Pueblo Indians in their ceremonies to induce rain.

Twenty-one rolling Babylonian cylinders made of hematite, serpentine, calcite, basalt and other stones, dating from 2000 B.C. to 500 B.C.; found at Bagdad, Persia.

Two hematite hemispherical drilled seals carved with different devices; Sassanian; 300 to 400 A.D.; found at Bagdad, Persia.

Two bloodstone hemispherical drilled seals carved with different devices; Sassanian; 300 to 400 A.D.

Ten hemispherical drilled seals made of red and brown sard, carnelian, banded agate and chalcedony; 300 to 400 A.D.

Two hemispherical drilled seals; one Parthian, made of gray chalcedony, and one with the device of the humped bull; 300 to 500 A.D.

Agate cone-shaped seal; Pehlevic inscription; about 500 A.D.; found near Bagdad, Persia. The original color of this agate has been changed to an opaque white by having passed through a conflagration.

Cone-shaped seal of brown and white banded agate; Parthian.

Carnelian; old Persian intaglio; Parthian; 300 to 500 A.D.

Assyrian cone-shaped seal; blue chalcedony (sapphirine); 400 B.C.

Assyrian cone seal of red ferruginous quartz; 400 B.C.

Seven engraved almandite garnets; three mounted as rings, intaglios; Persian; Parthian; 300 to 500 A.D.

Twenty-eight sard and carnelian intaglios; Roman; 300 to 400 A.D.; one with figure of Fortuna; stone has a white patina; found at Bagdad, Persia.

One gray chalcedony with Persian Parthian intaglio; three heads; from 300 to 500 A.D.

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Two amethyst *encabochon* intaglios; 300 to 400 A.D.

Onyx; Oberstein, Germany; stained to imitate the ancient East Indian onyx; two oval stones showing two layers of black and one of white.

Ceragate; one polished square; yellowish tint.

Carnelian; oval *encabochon* stone; East Indies.

Three oval sardonyx stones, regarded in the seventeenth century as symbolizing, in its name, the reconciliation of the law and the gospel, the onyx having been in the breast-plate of judgment, and sard in the foundations of the New Jerusalem.

Three oval pieces of sard; seventeenth century; in the seventeenth century was supposed to render the wearer proof against witchcraft and to make him cheerful and fearless.

Two chalcedony seals engraved with Persian inscriptions. One: "In the name of God, the most merciful. Say! God is one, God is omnipotent. He does not beget nor is begotten; nor has he any equal; not even one Ali! Oh, Ali!" Center inscription: "Victory from God and soon opening."

Three Persian seals; sixteenth to eighteenth centuries; made of red sard, brownish jasper and a black agate.

Persian seals, made of chalcedony and jasper—not ancient. In Persia, to every contract is affixed a seal. Nowhere is the use of seals so universal as in Persia, and every mule-driver or other person who cannot write carries a seal.

Eight Persian seals of brass, iron and copper; from the tenth to the fifteenth century.

Persian lapis-lazuli intaglio with Persian inscription; found at Bagdad, Persia.

Rich red sard seals with Arabic inscription; nineteenth century.

Rude garnet sard seal with Arabic inscription; nineteenth century.

Seven Persian seals; fourteenth to fifteenth century; found in Bagdad, Persia.

Sardonyx, banded agate; three chalcedony and one carnelian.

Chalcedony; was supposed in the seventeenth century to be a protection against evil spirits, to banish melancholy and to procure success for the wearer.

Small charms made of red and white carnelian, agate, etc., in the form of rude arrows; drilled at the barb end; originally worn as charms; found in an ancient Assyrian grave. Similar to those in the Assyrian gallery in the Louvre.

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Chalcedony cameo; Roman; 300 to 400; found in Persia.

Section of a chalcedony conoid seal; engraved *encabochon;* Roman; 300 to 400 A.D.; found in Persia.

Section of a hexagonal bead; engraved with an intaglio; the drill hole of the bead is visible all along the back; section of a bead.

String of five charms made of carnelian and silver; worn as a charm in Bohemia in the seventeenth century.

Banded agate; six; two beads, one talisman, two oval stones and one flat section; from Persia.

Chalcedony; three pieces; worn in the seventeenth century as a protection against the evil spirits, to banish melancholy, and to procure success for the wearer.

Two rings made of carnelian with heart-shaped shield on top; worn in Germany and Southern Europe as love rings.

Coral anchor, cross and heart made at Oberstein, Germany; carnelian; worn as charms in Italy and throughout Southern Europe.

Rings made of carnelian; ornamented with triangular facets; made in Oberstein, Germany, and worn in Italy as charms.

Heliotrope; was supposed in the seventeenth century to procure riches and fame for the owner. It was also regarded as a cure for the bites of poisonous reptiles and for hemorrhages.

Twenty-four cone-shaped pieces of sard from two to four inches long; drilled with an aperture large enough for the finger; heart-shaped, amulet-shaped and bead-shaped objects of carnelian, chalcedony and sard; made for the Tripoli market, where they are resold for the interior African trade. They are generally white and red—so-called tower rings. Those from two to four inches or more in length are most salable; the greatest demand is for light red.

For the Senegal trade they are generally tower rings, six-sided beads, generally from one and one-half to two and one-half inches in length; rings with a square, castle-like protuberance, heart-shaped, diamond-shaped, triangular, round and bead-shaped objects, all of which are drilled; made of sard, carnelian, chalcedony, seragate and chrysoprase.

For the Cairo market, where they are resold to traders who sell them in the Soudan, they are generally banded agate and onyx, striped brown and black in the form of leaf-shaped beads, tower rings and small, elongated, oval amulets. These articles for the African trade are all manufactured at Oberstein, on the Nahe, Germany, where they are especially manufactured for exportation to Africa, the prin-

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cipal points being Tripoli, Senegal and Egypt, where they are sold to the tribes in the interior. The demand for each locality is for the special patterns which are made for each country. Since the trade commenced the natives will only buy those patterns which are especially manufactured for them, never caring for any patterns that are sold to the other sections.

Dog's head charm made of banded white and brown agate with a rich green staining at the mouth; found in the Valley of Mexico, Mexico.

Charms; rattles of rattlesnake; made of red and brown obsidian; found in Jalisco, Mexico.

Touchstone; (basanite) black jasper; European jewelers' touchstone of the sixteenth century. The dark color of this material rendered it excellent to compare the various colors of gold.

Egyptian jasper; valued in the eighteenth century for the fancied resemblance to human faces which it contains.

Agate; used in the seventeenth century as an antidote to poison and a preventive of contagion; supposed in the East Indies to cure insanity and also to soften the anger of the wearer.

Two oblong pieces of jasper, one green and one brown; was used in the seventeenth century as a cure for diseases of the stomach, epilepsy, and one variety was supposed to protect the wearer from drowning.

Carnelian; supposed in the East Indies to insure wealth to the wearer.

Charm; small bivalve-shell-shaped object with small protruding point; drilled; to be used as ornament; made of red and black jasper from Jalisco; found in the Valley of Mexico, Mexico.

Charm; a brown, drop-shaped pendant; drilled at one end; made of yellowish-brown chalcedony.

Aztec heart-shaped pendant made of bloodstone (green jasper with red spots); used by the Aztecs in Spain in the fifteenth and sixteenth centuries to staunch the flow of blood from wounds.

Bloodstone pendant; heliotrope; pear-shaped; from the Valley of Mexico, Mexico.

In regard to a communication by water that was believed to exist between Asia and America, we have yet to find a single conclusive evidence that such a traffic existed. There is not a single object of silk, of carved ivory, of gold or silver work, enamel work, or porcelain, of Burmese or other Oriental woods, nor a single diamond,

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sapphire, zircon, chrysoberyl, alexandrite, or jeweled jade or jadeite, that can be attributed to an Asiatic contact, or of which we can positively affirm a Siamese or Burmese or Chinese or Japanese source, or say that this or that is a Ceylonese, a Burmese or a Cashmere gem. Yet nearly all these objects have been worked in peculiar forms since time immemorial in the oriental countries, with such marked carving of lettering or symbols as to render them unmistakable as having been made in particular oriental countries; while on the other hand there is scarcely an object of Spanish contact, such as Venetian beads, iron-worked buttons and other objects, that has not at one time or another been found in graves, often in apparent primeval forests. Jade we have not yet traced to its finding-place, but we surely will. Turquoise, which three centuries ago was only known in one locality, we find now may have been mined at half a dozen places.

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6

THE COYOTE AND THE OWL.

(*Tales of the Kootenay Indians*).

BY A. F. CHAMBERLAIN.

THE owl (*kupi*) figures prominently in Kootenay folk-lore as the bogey with which children are scared. "Keep quiet or the owl will come for you," is the threat used to silence noisy or crying children. It is the cunning coyote (*skinkuts*) who finally circumvents the owl and restores the children to their parents, by changing himself into a child, being taken away by the owl in her basket (*nabek*) to her lodge, and killing her after tricking her. The owl is represented as a cruel old woman, with a basket at her back, or in her hand—the basket or kettle is sometimes said to be made of water-snakes (*aqkinutlam*)—who, when she reached home used to take the children out of the basket one by one, and make them dance around her. But one day the coyote (in guise of a child) managed to kill her, and from her ashes were born mosquitoes and other like insects.

The first published version of the story is that of the Rev. E. F. Wilson in "Our Forest Children," Vol. III. (1890), p. 166. It is attributed to the Upper Kootenays and is localized—unlike the other variants—"on the banks of the Fraser River," quite beyond the habitat of the Kootenays. Wilson's version runs:

"Once upon a time, there lived on the banks of the Fraser River a bad woman, who caught young children and ate them, and carried them in a basket woven of water-snakes. One day she caught a number of little children and carried them back into the bush in her basket. The children peeped out of the basket and saw her digging a pit and making stones hot in the fire, and they knew that she was going to cook them as the Indians cook their meat, and so they plotted together what they would do. By and by the old hag came to the basket and lifted them out one by one, and told them to dance around her on the grass, and she began putting something on their eyes so that they could not open them; but the elder ones watched their opportunity, and while she was putting the hot stones into the pit they all rushed forward and toppled her over, and piled the fire into the pit on the top of her till she was burned to

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ashes. But her evil spirit lived after her, for out of her ashes, blown about by the wind, sprang the dreadful pest of mosquitoes."

For similar legends accounting for the origin of mosquitoes, flies, etc., see the article "Sagen vom Ursprung der Fliegen und Moskiten," in *Am Ur-Quell*, IV. Bd., 1893, S. 129–131. In a tale of the Kwakiutl of Ft. Rupert, recorded by Dr. F. Boas (*Journ. Amer. Folk-Lore*, I., 1888, p. 55), mosquitoes arise from the ashes of a fat cannibal and his wife, who are caused to fall into a fire-pit by some children, and a variant of the same legend is also given by him.

The versions of the coyote-owl story which follow were obtained in the summer of 1891, by the present writer, from Indians in various parts of the Kootenay region, who dictated them in their native speech.

(*a.*) COYOTE AND OWL.

(Told in the Upper Kootenay Dialect by Michel, an Indian of the Tobacco Plains, Sept. 13, 1891.)

The owl stays at a distance from the village. The child cries. Its mother says: Stop crying or the owl will get you. The owl comes at night to take children away in a basket—she takes away many children. One day the coyote said: I will do it. I will become a child. So the coyote changed himself into a little child. At night he begins to cry, and he is given to the owl, who makes off with him. They go to the owl's lodge, where there are many children. At night the coyote says: To-morrow you must get some pitch. The next day they get some pitch. At night there is dancing. First the owl begins to dance, and continues until she sweats much. The coyote says: Stop, I want to speak to you. The coyote melts the pitch in a hot fire. Then he says to the owl: Stop a while. He daubs the owl's eyes with pitch, so that she cannot see. He then seizes her and throws her into the fire, where she is burnt up. From her ashes come forth a multitude of little insects [mosquitoes?].

(*b.*) COYOTE AND OWL.

(Told in the Upper Kootenay Dialect by Paul, an Indian of the Tobacco Plains, Sept. 12, 1891.)

A child in the village begins to cry. Some one says: Stop crying or the owl will take you away. But the child continues to cry, and is taken away by the owl in her basket (or kettle). By and by there are no children left in the village. Then the coyote says: I am

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going to cry at night. He cries, and is told to be quiet, or the owl will soon come to take him away. But the coyote cries lustily, whereupon the owl comes and says: Give me the child. The child (coyote) is given her, and, putting it in her basket, she takes it to her lodge. There the coyote sees many children dancing. He takes pitch and rubs it over the face and eyes of the owl, so that she cannot see. He then threw her into the fire, and she was burned to ashes. All the children returned safely home.

(*c.*) COYOTE AND OWL.

(Told in the Lower Kootenay Dialect by Angi McLaughlin, August 20, 1891.)

The owl kept stealing all the children. The coyote said: I will become a child. So the coyote became a child and cried at night. He was told to keep quiet or by and by something would come to take him away. He kept on crying, however, and was thrown out of doors. The owl took him up and carried him off. He said to the owl: I am the coyote. Let us dance. They danced—the owl and the coyote. The coyote kills the owl and brings back the children with him, saying: I have killed the owl.

The variations of narration in the three versions given above, and in that of Mr. Wilson, are of interest as showing the extent to which this unwritten literature is subject to change. The origin of mosquitoes is, however, accounted for somewhat differently in the following legend:

THE ORIGIN OF MOSQUITOES.

(Told in the Upper Kootenay Dialect by Paul, an Indian of the Tobacco Plains, Sept. 12, 1891).

The [first?] mosquito was traveling and saw at a distance a number of lodges. A voice said: Come, eat choke-cherries! But the mosquito said: I don't want to eat them. So the mosquito left and traveled on. By and by he sees another village. A voice said: Come, you shall eat service-berries. The mosquito said: I don't want to eat them. So he leaves and sets out again. By and by he sees another village. A voice says: Come, you shall eat blood! This time the mosquito goes up to the village. He eats very much blood. His belly swells so much that at last when it strikes against a stick it bursts, and the mosquito dies. From his belly come forth a myriad of mosquitoes, who all fly away.

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RELIGIONS.

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RELIGIONS.

THE SCOPE AND METHOD OF THE HISTORICAL STUDY OF RELIGIONS.

BY PROF. MORRIS JASTROW, JR.

I.

IN the historical study of religions, emphasis is to be laid upon the term *historical;* and in doing so it is implied that there are other points of view besides the historical one, from which religions may be studied, and which, moreover, are equally legitimate. Among these points of view we may instance the dogmatic and philosophical. Starting from the assumption that religious truth is not only a clearly definable substance, but has found its embodiment in a definite religious organization, the remaining religious bodies of the world, ancient and modern, and the doctrines held by them, may be subjected to a minute and even searching investigation, but with the single purpose of discovering wherein their error lies. Examples of such a treatment of religious truth will occur to every one, and, indeed, until the close of the last century, the dogmatic method may be said to have had the field to itself, to the exclusion of any other; and this remark holds equally good whether we turn to the Mohammedans and note their treatment of other religions than Islam, or take as our example Christian or Jewish scholars, and consider their attitude towards religions lying outside of the pale of Christianity or Judaism. "Truth is single, and has only one prophet," is the axiom which forms the starting-point and the goal—the method and scope of the dogmatic study of religions. The obvious strength of the method consists in its power of placing the salient features of the side it advocates in their strongest light, while it shares the inherent weakness of many an apologetic method in its failure to touch the really vulnerable points of the opposing cause. It is possible, however, to err on the side of breadth as well as on the side of narrowness; and if the dogmatic study of religions offends us by its persistent refusal to extend the mental vision beyond a certain well-

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defined circle, the philosophical attitude towards the history of religions, which began about the middle of the last century, and found its most distinguished expounders in Herder and Hegel, fails to satisfy, because of its almost fanatical desire to recognize certain phases of truth in all the manifestations of religion, and which is equivalent to a denial of absolute truth. The attempt to define these phases which constitutes the necessary goal of the philosophical method reveals with equal necessity its defects, for the sufficient reason that what may be termed the personal equation constitutes a too prominent factor in any endeavor to determine the relationship existing between the underlying ideas of religious thought at the various stages of their development, and the combination of these ideas into a progressive and continuous series. The notable utterance of Lessing—himself an exponent of the philosophy of religion—that the search for truth is more befitting human conditions than the possession of truth, summarizes the fatal limits of the study of religion when viewed from the point of view of philosophy. The search for truth is bound to be in the last instance a subjective process.

But, on the other hand, the importance of the philosophical attitude towards the course of religion as complementary to the dogmatic position cannot be overestimated. Its vitality being dependent upon an extended mental vista, the impartial and untrammeled investigation of the religious history of mankind follows as a necessary corollary. The strong impetus given by such master minds as Lessing, Herder and Hegel to an investigation of the phenomena of religion in the eras of civilization as well as among men living under primitive conditions, led in turn to the deeper appreciation of the beauties to be found in the manifold forms that religion has taken on. The one-sidedness resulting from the dogmatic method found its corrective in an increase of accurate knowledge regarding all religions; and, religions no longer being placed on opposite sides of the balance, there was no need of increasing the weight of the one at the expense of the other.

II.

Turning to the historical method, in the criticism just made of the dogmatic and philosophical approach to the subject, there is implied by contrast what is meant by a historical study of religions. It may be defined as the unbiased investigation of all facts connected with the religious history of man, and the attempt to interpret these

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facts, not by any system of thought or standard of life, but in the light of the conditions that give rise to the manifold phenomena of religion. Through these features, the historical method is sharply divided off from other attitudes towards the religious drama of mankind. While sharing with the non-dogmatic position the breadth of grasp and the endeavor to be impartial, it does not commit itself to any unification of the various factors in the drama, and in this way, as well as by a rigid adherence to the principle involved in an assumption of interdependence between social conditions and facts, avoids the danger of subjectivity in the interpretation of the facts. An admirable illustration of the historical method, which gains additional interest from being the earliest notable product of an historical study of religions, is furnished by Carlyle's study of Mohammed in his lectures on Hero-Worship. Carlyle's starting-point is the conviction that, whatever may be our view of Mohammed and his religion, the man and his doings must be accounted for from a knowledge of his surroundings. He accordingly enlarges upon a description of the social and religious status of Arabia at the time of Mohammed's birth, and analyzes the influences that must have co-operated in bringing about Mohammed's revolt against the rites and beliefs of his ancestors. Reconstructing in this way the outlines of the man as moulded by his surroundings, it is a comparatively easy task to complete the picture by adding to it the personal qualities of mind and disposition that distinguished the man. This being accomplished, the conditions are ripe for a study of Mohammed's career that will at once lead to a satisfactory explanation of his success, and at the same time to a recognition of the reasons for the man's limitations and the corresponding blemishes in his career. The merit of Carlyle in brushing aside once for all the tissues of lies that European estimates had woven around the person of the great religious teacher, is but a natural outcome of the method he pursues, but it must be also born in mind that the same method prevents him from entering upon any "whitewashing" process—so natural a temptation to any one engaged in fighting down prejudicial opinions.

Proceeding in Carlyle's footsteps, Prof. Max Mueller calls for mention here as one of the first to combine with historical method that broad and scientific study of religious phenomena which has succeeded in giving to the so-called science of religion its present position as a distinct discipline. Whatever may be the fate of certain theories associated with the name of Max Mueller, historical science

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owes him a deep debt of gratitude for having established, as a *conditio sine qua non* of the historical study of religions, the recourse to the original sources for our knowledge of any religion, and coupled with this the added necessity of original research on the part of the investigator. It was historical intuition rather than profound knowledge that led Carlyle to an adoption of his historical method, but what constitutes strength in him forms a danger to those not similarly gifted, and men of the type of Max Mueller provided the safeguard against the allurements of historical intuition by combining it with the scientific habit of thought that is the fruit of original investigation. A proper understanding of the element thus contributed will help to dissolve what is perhaps the greatest difficulty confronting the student. The range of the discipline is naturally very wide, and the painstaking involved in the gathering of facts has been rendered even more laborious by the constant accession of new material. It is sufficient to instance the travels and explorations that have added to so remarkable a degree to the minuteness of our knowledge of peoples in all parts of the inhabitable world, and especially of those whose inhabitants have until recently lived their lives apart from the currents of civilization. No less significant are the prehistoric researches which form one of the glories of the age, and if to this be added such factors as the opening up of Sanskrit literature, the recovery of the lost civilizations of the ancient Orient, the new light in which modern criticism has placed the Bible records, the accession of fresh material for classical antiquity, it will be seen that, no matter how small an area we may choose for our special object of study, e'en as when a stone is cast into the water, we are faced by the problem of determining where the limit should be set to an ever-increasing circle. The impossibility of gathering all one's facts at first hand is obvious, and on the other hand the exclusive reliance upon the material made accessible by others has its outcome in superficiality, and is characteristic of dilettantism, but not of genuine science. But, the scientific habit of thought being the essential condition for fertile research, the solution suggested is, that independent investigation for *some* section of the study of religions is an indispensable factor. It matters little whether the section chosen be the prehistoric phases of the most primitive religious thought or one, or, happily, more than one of the great historic religions, so long as the task involves the scientific method of looking at facts which is a part of the historical method. Upon our ability to pursue original investiga-

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tion for a certain part of the field depends the proper utilization of the researches of others. The danger of dilettantism being greatest in the study of religions, for the very reason that the subject seems so near to us, the fulfillment of this preliminary condition is one upon which too much stress cannot be laid. That condition once fulfilled, the widest possible use also of the aid offered by disciplines bearing on the subject will prove to be of great service for that part of the field which we may properly call our own.

III.

It is needless to enlarge upon the aids I have in view; a brief characterization of them will suffice. Anthropology in the narrower sense is to be noted in the first instance for the reason that its bearings upon the development of religious ideas and rites has only recently come to be understood. The question of race enters largely as a determining factor, not so much in the development of religion, but in the limitation of that development. Difficult as it may be to us to accept the conclusion, it yet appears to have been ascertained that certain races are bound, as it were, to well-defined religious conceptions, and, however much external conditions may change, the progress of religion among them does not pass beyond positive limits. It will be no less clear, therefore, that the question of what may be called religious distribution is profoundly affected by the study of racial characteristics. No less important than the utilization of researches made in this direction are the bearings of the new psychology on the history of religions. The interdependence between psychical processes and physiological states is the part of the subject that I have more particularly in mind. Complementary to the more general bearings of racial traits, we have in the study and interpretation of mental phenomena a valuable aid to an understanding of special and individual religious temperaments. It is perhaps too early to apply the results of physiological psychology in their fullest extent, but one is quite safe in predicting that our view of the great religious teachers of mankind, more especially of the mystics, is certain of being both clarified and modified by a deeper penetration into the workings of the mind peculiar to them. It seems, in the third instance, almost superfluous to refer to the part that Folk-lore plays in a general historical method. So generally is this point recognized, that one feels tempted rather to sound a note of warning against an unwarranted estimate of its value which seems to be springing up in certain

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quarters. The special province of Folk-lore, so far as the study of religions is concerned, is to throw light upon religious customs and survivals. In this respect we have been taught the great value to be put upon little touches in religious rites a peculiar motion of hand or body, certain expressions used almost unconsciously by people, and the like. Very frequently the apparently unimportant detail furnishes the key to the understanding of a great body of important facts. Nor is it too much to say that Folk-lore has modified the contemptuous estimate that superficial considerations were accustomed to place upon what is commonly termed superstition. The necessity of some expression to religious emotion being admitted, superstition and legitimate rite stand in a relation of past and present to one another; or, to put it more definitely, the rite of one age becomes popular custom in another; but only after a new phase of the rite in question has been reached. In no other department of the subject can the continuity of the religious instinct of man be so clearly studied as in that of religious ceremonies. The rubbing of one's body over a sacred stone is prompted by the same desire for communion with a being supposed to exercise a control over us that leads in the refinement of religious thought to the outpouring of the soul in prayer. But it is likewise evident that in the bearings of Folk-lore on the development of religious rites, there lurks the danger of an abuse of the comparative method, nor can it be denied that an actual abuse of this character has tended to raise a suspicion as to the scientific value of Folk-lore studies, or, if that appears too strong a statement of the case, has created an attitude of reserve on the part of scholars towards the utilization of its results. To avoid this danger, the very simple principle suggests itself, of not attempting to prove too much; though it should at once be added that here as elsewhere the suggestion of the remedy is far easier than its application. While, in tracing the unfolding of rites and customs, the scope of observation ought to be just as wide as possible, we must learn the lesson of contenting ourselves frequently with a statement of analogies and coincidences, without drawing therefrom the consequences which at first blush might appear obvious. It would be wrong, however, and injurious to depreciate the value of comparative researches because of the mazes that beset one's path. The example of Prof. Robertson Smith for the field of Semitic religions ought to be sufficient to disarm the skeptics, and even though so great a scholar as J. G. Fraser, on the other hand, has allowed himself to be led astray occasionally by an application of

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the very same method that distinguished his eminent colleague, still his studies in comparative religions, notably his great work on "The Golden Bough," mark the decided advance that has been signaled in the historical study of religions through the valuable aid furnished by Folk-lore. It may cheerfully be admitted that the ocean of comparative science is strewn with the wrecks that tell the sad story of the daring of inexperienced navigators, but it is wrong to put the blame on the ocean, or even on the vessel. And after all, taking all things into consideration, while one is justified in uttering the warning, "Be not too bold," we are equally warranted in adding:

> "Better the excess than the surcease,
> Better the more than the less."

It is, I venture to add, in the realm of primitive culture that the mistakes through a too rash application of the comparative method are in the main liable to be made; and it seems timely, therefore, to urge the value of the method, more especially in the study of the great historic religions; and if for no other purpose than to illustrate the manner in which present thought and custom is yet closely linked to a past withal so dissimilar to modern conditions of life. The point, it will be seen, has a practical bearing, and raises the pertinent question as to the proper scope of the historical study of religions. It is idle to disguise the fact that in many, even scientific, circles, there prevails a certain fear upon entering what appears to be a thorny field; in other quarters, there is a vague notion that in some way the investigation of religions is bound to create havoc within the domain of religious faith. I venture to controvert both allegations involved. The scholar who permits himself in his researches to be swayed by any other motive or consideration than the pursuit of truth is a traitor to his cause, and yet I see no reason why the scholar, in dealing with matters that constitute the most sacred possessions of mankind, should not be reverent in his manner of treatment. He should remember that the ground on which he treads is holy—if not to him, then, what is more important, to others. This is the one concession that may be legitimately demanded of him, or, rather, a proper regard for the feelings of others should be so natural to him as to remove the consciousness of making any concession. But I go farther, and declare that the study of religions within its legitimate limits has absolutely no bearings on questions of pure faith. The qualification of "historical" as it suggests the method, also indicates the

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scope of the study. It must be free from any *Tendenz*—to use the stronger German word—and in this respect, too, is sharply separated from a dogmatic or philosophical study. Confining itself to a study of past or of existing religious conditions, the value of the discipline lies in the light that it may be expected to throw upon them; but beyond this there is absolutely no reason why it should proceed. It does not concern itself with the truth or falseness of doctrines any more than it enters upon a criticism, favorable or otherwise, of religious rites, but regards everything connected with the religious life of man from the historical point of view, and that solely. This limitation being recognized, one can see no reason for even the possibility of a conflict. On the contrary, if any conclusion may be drawn from historical researches bearing on the sufficiency of religious faith, the conviction that deepens upon the student, the clearer his grasp and the wider his vision, namely that religious faith and religious emotion exist everywhere, and under all conditions, follow mankind from the cradle of culture to the estate of manhood, constitute an essential part of his nature, corresponding to certain needs of his being—if, I say, any conclusion at all is to be drawn, it can only be that the historical study of religions serves to set off the religious side of man and mankind's history in a stronger and more brilliant light.

IV.

Let me add a few words as to the position of the study of religions in the university curriculum, and with some indications, necessarily brief, as to the equipments for a proper study.

It is gratifying to note that several of our American institutions have quite recently followed European precedents in introducing the subject among graduate studies.* At Harvard, indeed, its importance has been recognized for some time. Cornell about two years ago established a special chair for the study in the Sage School of Philosophy; at the University of Pennsylvania courses in ancient religions constitute a feature of the Department of Philosophy, and the vigorous University of Chicago has set the example to the institutions of the West in making special provisions for the discipline. But in order that the historical study of religions may be carried on

*For a fuller presentation of the present status of the Historical Study of Religions in this country I may refer to my article in the *Biblical World*, Vol. I., No. 1.

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in accord with the method above outlined, something more than a number of courses or even a special chair is demanded. The French Government has recognized that by means of a special department alone can satisfactory results be attained. At the Ecole des Hautes Etudes of Paris there was established a few years ago a "Section des Etudes Religieuses," with a faculty of no less than twelve members. In this way a chair was provided for each one of the great religions, or groups of religions, and assigned to a scholar who had made the sources for the respective branch the object of his special investigation. For so extensive a subject as the History of Christianity, further subdivisions were made. The plan, it will be seen, admirably fulfills the one condition of a true historical method in laying the proper emphasis upon original research, and thus closing the doors effectually to any kind of dilettanteism. The general and comparative aspects are supplied by the chair for "L'Histoire des Religions" at the College de France, so ably filled by M. Albert Reville. On the other hand, a defect of the French school consists in its failure to furnish that broad illustration from the various fields that have above been shown to be essential to a complete study. In addition, therefore, to the study of the various religions, a fully equipped department calls for a presentation of the main principles, at least of Anthropology, Psychology and Folk-lore, and as much more than the principles as may be found feasible. To meet the practical objections that may be raised against so apparently extensive a scheme, it may be pointed out that the larger universities of this country, with special chairs already established for the study of the various Ancient Languages, and with equipment for Anthropological and Psychological researches, are in a position with but little additional expense to create such a department as is here in view. The teaching corps being provided for, the introduction of a number of additional courses and the adaptation of others already introduced is all that is needed to make a good start.

V.

Lastly, a valuable adjunct to any study of religions that must not be overlooked is the Museum of Religious History. Paris is fortunate in possessing the greatest collection of this character in the famous Musee Guimet. One who has seen the rich display, which fills an entire building, and yet only embraces a restricted section of the religious history of man, might despair of the possibility of securing a complete or even adequate illustration to the subject. Yet the

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task is not so great as at first blush appears. The value of a working museum of Religious History does not lie in an extensive array of objects as much as in the proper arrangement of characteristic *specimens*. Hardly less important than specimens, and frequently supplying the lack of the latter, are models, photographs and maps—all of which are easily to be had nowadays. The time allotted to me precludes the unfolding of any detailed plan for a Religious Museum, and I must, therefore, content myself with a summary of the principles that should govern the choice and arrangement of objects.

A three-fold division of the museum, into general, special and comparative, suggests itself. To each a separate room or section should be assigned, following one another in the order mentioned.

A.

The general section will consist chiefly of diagrams to illustrate:

(*a.*) The divisions of the subject.
(*b.*) The sequence of the various religions.
(*c.*) The past and present geographical distribution of religions.
(*d.*) The main elements of religions.
(*e.*) The characteristic traits of the various races of mankind.

B.

In the section devoted to the special illustration of the various religions, and which will form naturally the kernel, as it were, of the museum, there shall be a further subdivision into:

(*a.*) The religious life of primitive man.
(*b.*) The religions of civilization.

The basis of illustration for the first division shall be the geographical distribution of primitive doctrines and rites; in the second division, each religion is to be treated independently, and the illustration shall cover the entire scope of the religion in question. Charts and models will form the main feature in the first division; objects used in worship will predominate in the latter.

For illustrating the religion of primitive culture, such sections as ancestor-worship, talismans and objects of adoration, beliefs in good and evil spirits, birth, marriage, burial and military customs are to be taken up in succession; for the illustration of the religions of civilization, the more or less elaborate ritual in each case should form the

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starting-point, and the illustration with the aid of models or diagrams of altars, temples and ceremonies should follow the order of the religious observances during the year or, in certain instances, cycles of years. Accompanying this illustration shall be charts in the case of each religion, giving a summary of its salient traits and of its history.

C.

In the comparative section, the main purpose shall be to maintain a strict consistency with the two other sections. It will, accordingly, consist of:

(*a.*) The duplicates of the objects and models embraced in the special division, but arranged according to a certain order of subjects, and

(*b.*) Charts showing distribution of various doctrines and customs, their agreements and points of divergence among different peoples, arranged in order the of historical development.

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AN ANCIENT EGYPTIAN RITE ILLUSTRATING A PHASE OF PRIMITIVE THOUGHT.

BY SARA Y. STEVENSON.

TWELVE years ago—in 1881—five royal pyramids of the Vth and VIth dynasties were opened at Saqqarah, and their walls were found to be covered with extensive religious texts. Mr. Maspero, under whose supervision the work was conducted, immediately applied himself to their publication,* and the difficulties of the undertaking, as well as the richness of the material discovered, may be estimated by the fact that only this summer has the task been completed. The work is of the greatest importance to Egyptologists, to whom these texts have opened an entirely fresh field of research.

The Egyptian language—its grammar, its syntax, and even its graphic expression—underwent many serious changes during the millenniums of its existence, and the inscriptions of the early period until then available were, comparatively speaking, unimportant.

When Mr. Maspero undertook the task before him, little had yet been done towards the study of the archaic language of Egypt. He, therefore, had to grope his way through the dark, in his effort to reach the light which now, thanks to him, others may use to find their way to a fuller understanding of those remote ages. Had he accomplished nothing else, he would have deserved the gratitude of the learned world; and as I am about to make free use of the material which he has not only made available, but upon which he has so luminously brought to bear his own ingenious scholarship, I take pleasure—at the time when he has just completed this great work†—in publicly paying him the tribute which I feel is his due, and in calling the attention of anthropologists to the bearing of his researches upon the broader study of religious ideas and rites. For specialists are not alone concerned in the study of these texts; they are of value to all who are interested in the development of human thought.

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* *Recueil de Travaux*, etc., Vols. IIIrd, IVth, VIIth, VIIIth, IXth, XIth, XIIth, XIVth.

† *La Pyramide du Roi Pepi II.* Rec. de Trav. XIV. liv. 3 and 4, pp. 125–152.

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They have revealed to us in all its genuineness—untampered with by scribes, translators and priestly commentators—the religious expression of men who, if they had already attained a high degree of culture when they first appear before us, belonged—as is attested by many survivals from very primitive times in their industrial methods, as well as by their language, their graphic system, and their mode of religious thought—to an understratum of mankind.

The Pyramid-texts have preserved ancient formulæ—forming a part of the funeral ritual of the Egyptians according to which the various ceremonies connected with the honoring of the dead were regulated. The importance of this ritual to the Pyramid-builders may be estimated by the share that preparation for death played in their hope of immortality. Mixed in among the prayers and incantations here are also to be found indications of the ceremony in the course of which these were uttered.

It would seem as though anxiety was already beginning to be felt lest the ancient usage should in time be overlooked.

Although slight, these indications—when compared with the rubrics of later times—are enough to show that this ritual was then already firmly fixed; and the inference is that the rites in question may with safety be ascribed to a very early period.

Mr. Maspero * has pointed out that, as centuries and millenniums rolled by, the real meaning of the mimicry originally adopted in the ceremonial became dim in men's minds, and a tendency towards modification was felt. Under the New Empire the rites were performed indifferently in a more or less perfunctory manner. Ideas had changed; new interpretations were superseding old ones; and the thought embodied by their ancestors in the minutiæ of the ancient forms was only understood by a few. Accordingly rubrics were added to the texts, and indications were given for the proper celebration of these more important rites which—according to sacred tradition—were essential to the life of the dead.

The publication of the Funeral Ritual was begun by Signor E. Schiaparelli † in 1881. The principal text used was found by him transcribed in black and red inks upon the coffin of a royal scribe of the Theban Nekropolis—Bute-haamon—who lived under the XXth dy-

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* *Rituel du Sacrifice Funéraire*, 1887.

† *Il Libro dei Funerali degli Antichi Egiziani.* Erm. Loescher, 1880–1882. Roma, Torino, Firenze.

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nasty. This, compared with the funeral roll of the lady Sais,* who lived in the Roman period, served him as a foundation for his work.

The obscurities which such a book offer to the modern mind were partly dispelled by a careful examination of the paintings in the tomb of King Seti I.,† which—in their representation of a series of scenes enacted by priests around the funeral statue of the deceased monarch—revealed the full meaning of the performance referred to in the texts studied by the Italian scholar.

All are, in fact, but different editions of the Ritual which the kings of the old empire had inscribed upon the walls of their Pyramids. Moreover it has since been possible to supplement certain lacunæ in these various documents by means of paintings discovered on the walls of several other Theban tombs.‡ These independent versions serve to elucidate each other and furnish a very complete description of the ceremony.§

As is well known, the Egyptians entertained, upon the subject of the after life, a variety of notions which, although to us seemingly conflicting, do not appear to have excluded each other in their minds.

These are obviously of gradual growth, and must have been the result of altered conditions in the material existence of the people, who thus were led to conceive man as a complicated organism endowed with a multiplicity of spiritual elements, each of which was designed to accomplish a distinct destiny.

Of all these conceptions, the only one which concerns us at present—not only because it forms the basis of the rite which we are about to consider, but because it evidently belongs to the earliest stages of primitive thought—is that which regards the dead as living in the tomb, and as enjoying the material comforts provided for him by the piety of his survivors.

This belief is a wide-spread one among men in a low stage of culture who practiced cave or mound-burial; and the present popu-

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* Th. Deveria. *Catalogue des Manuscrits Egyptiens du Louvre*, pp. 170–171, VII. 4. Inv., No. 3155. This MS. is mutilated, but contains a liturgy in which are mentioned the different orders of officiating priests, and in which their rôle or special action is indicated.

† Schiaparelli, loc. cit. III. *Testo Monumentale di Seti I.*, 1881.

‡ J. Duemichen, *Der Grabpalast des Patuamenep in der Thebanischen Nekropolis*. Leipzig, Y. C. Heinrichs, 1884–5. 2 vols.

§ G. Maspero, *Le Rituel du Sacrifice Funéraire*, pp. 11, 1887.

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lations of Europe*—as well as the later inhabitants of Egypt †—have retained in their folk-lore traces of the strong faith which prompted their early ancestors to such stupendous efforts for the purpose of providing "eternal dwellings" for their dead.‡

But the Egyptians, with their characteristic realism, carried these beliefs further, in their logical consequences, than any other people. And, as they reached a high degree of culture, art and ingenious mechanical devices were placed at their disposal, and helped to bring about the surpassing degree of development that now astonishes the superficial observer.

Already in the early days of Egyptian history means had been devised for the preservation of the body, the integrity of which was regarded as the necessary condition of the survival of the spirit. Moreover, to guard against the possible contingency of its destruction, portrait-statues of the deceased were secreted in the sepulchre; veritable false-bodies in which this most material of spirits, the "Ka," might dwell should the mummy fail it.

All this was not enough; death had sealed the mummy's lips, closed its eyes; and the practical, intelligent Egyptian of Pyramid times apparently knew full well that the stone or wooden statues were not, in themselves, capable of carrying on a human existence.

But of their primeval days they had preserved the belief that it was in their power to endow these statues with life.

This seemed easy to accomplish at an epoch when formulæ and other practices which we term magic were regarded as all-powerful even over the gods. Thus it was that the intricate Ritual called the Ap-Ro ("the opening of the mouth") was devised, by the help of which not only, as hinted by the title, were the mouth and eyes of the mummy or of the "Ka" statue opened, that it might see and partake of the comforts provided for it by the piety of the relatives of the dead, but his life was brought down to dwell in it.

The whole ceremony was an elaborate mystery, a sort of "Passion play," in which was enacted the Osirian drama. It was accompanied with lamentations, sacrifices and a funeral repast, in which the

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* Boyd Dawkins, *Early Man in Britain*, p. 328–335, etc.

† S. Vattier, *L'Egypte de Murtadi*, p. 46–48, 57–124. Makrizi, quoted by S. de Sacy, *Observations sur le Nom des Pyramides*, p. 37. Maspero, *Rec. de Trav.*, I., p. 160.

‡ Gabriel de Mortillet, *Le Préhistorique.*

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mummy played the rôle of Osiris, and in which took part as many actors as the wealth and station of the deceased might warrant.

It would be tedious and unprofitable now to go over the whole of the complicated ritual in all its details. An account of its more important parts may be found in Mr. Maspero's admirable résumé published in the *Revue de l'Histoire des Religions*, in 1886.

The part of the performance to which I wish to refer was originally intended to take place in the sepuchral chamber, or, as the Egyptians called it, the "Golden House" (Hat-nub), although from earliest monumental times this chamber, constructed at the foot of a deep well, was rendered inaccessible for the purpose. This, and the mention of the mystic use of green paint in the rite intended to open the eyes of the statue, may be considered as attesting the hoary antiquity of this Ritual. It is only in the most archaic art that we find the defunct represented with a band of green paint run across the eyes;* and, as far as I know, the only mummy recovered whose eyes had been painted green is one found by Mr. Petrie in the very ancient Nekropolis of Medum.†

In historical times the rite was necessarily performed either in the sepulchral chapel or on the platform in front of the tomb. Four performers took part. The preliminary ceremony was purificatory. The mummy was placed upon a bed of sand.‡ A priest, acting the part of servant (Sem), or of a friend (S-mer), walked four times around it, censer in hand, sprinkling it with water from four different vessels, repeating the important formulæ in which the defunct was identified with Horos, the highest god, and his children, *i. e.*, Horos, Set, Thoth and Soped, here representing the four cardinal points or the great houses of heaven. At a certain point of the ceremony the four actors personified these gods. This was done twice: for the north and for the south. The whole process was repeated over again with incense from the north and the south, and once more with the divine incense, "Sen-nuter," of foreign origin.

The preliminaries over, the first performer, wrapping himself up in a shroud-like scarf, lay down, feigning sleep, whilst two new personages—the officiating priest, or "Kher-heb," holding a roll of papyrus, and his assistant—entered to see the dead.

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* Mariette, *Mastabas*, p. 68.

† *Medum*, W. M. Flinders-Petrie, 1891, p. 9; the mummy of Ra-Nefer, eyes painted green upon the shroud.

‡ *Rituel du Sacrifice Funéraire.*

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Another actor, the "inhabitant of the sepulchre" or "Ami-asi," who had stood on watch beside the statue, then awoke the sleeper, who, sitting up, said: "I have seen my father under all his forms." The others answered: "Is not this thy father?" after which followed a mysterious dialogue in which the defunct was identified with Osiris.*

It is not unlikely that this feigned sleep of the priest was intended to convey the idea that his spirit had traveled to the land of spirits. Sleep and death were closely connected in the primitive mind, and dreams were looked upon as a common medium used by the gods to reveal themselves and the unknown to their worshipers.† For instance, the Alexandrian author of Poimandres, relating his vision, says: "The sleep of the body produces lucidity of the intellect—my closed eyes saw the truth."‡

These first scenes of the performance were intended to restore to the dead his shadow—that mysterious companion which the Egyptians regarded as an essential part of man's complete personality, and which originally they, in common with other races in a low stage of culture, probably looked upon as the spirit.§

Having accomplished this, the Sem arose, took a lotus-headed stick, and, adorning himself with a large jeweled collar, which Mr. Maspero calls an ephod, he addressed the statue, and, urged by the other performers, he proceeded to touch its mouth and eyes with adzes of wood and iron, each of which had a name and was especially intended for the purpose to which it was put.

The rite was a most lengthy process. It was accompanied by numberless formulæ recalling episodes of the Osirian myth, and was several times interrupted by the sacrifice of at least two oxen, the heart and thigh of which were laid at the feet of the statue, and of other lesser victims, such as birds or gazelles.

The mouth and eyes of the defunct had been declared open; but now they must be healed, that he might use them, and that the mystery might be perfected. This was done with the help of a rod in the form of a ram-headed serpent, upon whose brow stood the

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* Maspero, *Archéologie Egyptienne*, p. 147; fig. 151, gives the representation of this scene.

† See the Stela of the Sphinx, for instance. *Records of the Past*, Vol. I.

‡ *Etude sur l'Origine des Livres Hermétiques*, L. Mènard, p. 58; *Hermès Trismégistus*, 1867, Paris. See also p. 146 in the *Asklepios*.

§ Schiaparelli, loc. cit. iii., *Tavola*, LII.

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uraeus, a veritable magic wand by the virtue of which was wrought this greatest of prodigies, and whilst the Sem touched four times with this wand the eyes and mouth of the statue, the officiating priest spoke the following words:*

"My mouth was sealed—it is I who have put it in order as well as thy teeth, O statue of the Osiris. Nut hath raised thy head—brought all the gods to thee. Thou hast charmed them—thou hast made them live—thou hast become the stronger, and hast performed the life-giving act with them behind the statue of the Osiris N., that he may prosper and not die. Thou hast mixed with the 'Kas' of all the gods, and as thou risest as King of Upper Egypt—as thou risest as King of Lower Egypt—sovereign among all the gods and their Kas; therefore Shu, son of Atum, it is he—the Osiris N. If he lives thou livest. He hath armed thee Shu—He hath saluted thee Shu—He hath exalted thee Shu—He hath made thee sovereign Shu—and thou hast performed the life-imparting act,† behind the statue of the Osiris N. So thy life-force is behind him that he may live and never die. O statue of the Osiris N., Horos hath divided thy mouth, he hath opened thy two eyes with the divine adze and the 'urhikau,' which is used to open the mouth of all the gods of the South."

In paintings of later times, the soul is sometimes depicted hovering over the mummy, holding to its lips the ankh, or life-hieroglyph, and the Sail, or hieroglyph for "Breath,"‡ which, from the Egyptian point of view, was an artistic rendering closely related to the idea expressed by the "Kher-heb," when, after bringing down life to dwell into the statue, he, as we have seen, identified the dead with Shu, the air-god, who supports the heavenly vault and its divine host.§

It is quite clear that the Egyptians regarded life as inherent in their nature-gods, and as forming the principal attribute of their divinity. The hieroglyph for "life" was placed in the hand of every divine personage, and the granting of the divine protection was symbolized by raising this emblem to the lips of the worshiper.

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* Maspero, *Rituel du Sacrifice Funéraire*, 1887.

† Pierret, *Dict.*, 1875, p. 516, translates the "Sa": protection (from behind). A variant of the hieroglyph usually used is held in the hand of the goddess Thoueris, whose favorite emblem it is. She was esssentially a mother-goddess, and its association with her instead of the "ankh" is very significant.

‡ Wilkinson, *Life and Customs of the Ancient Egyptians*, III., p. 159, 1879.

§ Shu "the god of light," of which the "air is the soul." H. Brugsch, *Recueil de Monuments Egyptiens*, XXXIV., 4.

St. Paul speaks of the "Prince and power of the air."

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The "life-force" seems to have been conceived by the Egyptians as a magnetic essence, which has been aptly compared by Mr. Maspero to the "aura" of our modern spiritualists.

How apt is the comparison may be judged from the following passage out of a leading Spiritualist paper, published in Chicago, that most progressive of modern cities, where, after stating that every living form possesses a "duplicate soul," the writer adds: "The fragrance of the flower, the 'aura' of the animal, are none other than soul-elements which have passed through organic change, in preparation for an advanced step in evolution." "Life is a permanent force which separates from matter and goes with the soul-substances."* . . .

An ancient priest of Ptah or of Osiris could not have better described his belief, nor would he have repudiated the following assertion obtained from a similar source: "When the spirit leaves the body it stands or floats without the prone dead casket—intact in itself—clothed in its spirit body, which has been evolved from the mortal, of which it has been the spirit counter-part." . . . "It can as readily and as easily exist in the earth atmosphere when without the material body as it could and did a living entity in a mortal man; and the home of earth-spirits surrounds and includes the earth where they first took on consciousness."

The above quotations are only intended to point out the fact that in this, as in many other instances, we are the dupes of our own nomenclature, and that the name of spiritualism, in so far as it awakes in our minds an antithesis to materialism and an effort towards idealism, is a misnomer, if applied to the sect so termed by us; for the fundamental tenets of its faith rest upon a reversion to naturalism and to the belief that life and soul-elements can be subjected to human control by esoteric means.

I will not go further into the closing details of the Funeral Ritual. From what has already been said it may be seen that it was a long drawn out performance, divided into many scenes, during which the principal actors repeatedly altered their garb, and in which entered endless repetitions and much obscure dialogue containing allusions to ancient myths. Its sole merit and interest lay then, as it does now, in the faith of the worshipers.

When concluded, the defunct was purified; his shadow had been

* *The Banner of Light*, July 18th, 1891.

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returned to him; the eyes and mouth of his Ka-statue were opened and healed; its jaws had all the necessary elasticity; it had partaken of the funeral feast; and the priest, by the imposition of hands upon the back of its head, had brought down into it the life-force (Sa-en-Ankh).*

When left in possession of his "eternal dwelling," the dead, well supplied with comforts and luxuries of all kinds, and surrounded by the scenes and friends dearest to him, was fully able to enjoy what happiness he might find in his ghostly existence. He was then. as he is called in the *Pyramid of Teti*, the "living dead," or more literally, "he who is" and "he who is motionless." †

This ancient rite is perhaps deserving of more general attention than it has hitherto received, for it illustrates very fully, and lays before us, as it were, in a crystallized form, a phase of primitive thought which long outlived the early conditions to which it properly belonged, and gave rise to many practices that have survived, more or less modified in their details, down to modern times.

Spells somewhat analogous, and wrought in order to accomplish a similar purpose, are found among widely remote races in a low stage of culture. To mention but one instance, Castren states that, among the Finns, rough images called "Paras" were manufactured and carried nine times around the church in the morning, the faithful muttering all the while: "Live, para."

Then the "Para" began to live, that is, a spirit or Hastia came to lodge within it, after which the protection of the fetish over the household became operative.‡

Likewise in Egypt, not only were the "Ka"-statues of the dead thus made to live, but the divine life was also brought down into the oracular statue of the gods.

The well-known *Stèle de la Bibliothèque Nationale*, published by De Rougé, has taught us how these statues might be multiplied, each remaining the true body of the divinity represented. All that was

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* Maspero (loc. cit.) translates the Sotep-Sa "Le passes de vie." I give it the value "The life-imparting act," because it would seem from the *Stèle de la Bibl. Nat.*, where a statue is said to perform this service to another statue, that the result might be obtained by the imposition of the hands on the back of the head.

† *Recueil de Trav.*, Vol. V., 1884. *Pyr. of Teti*, L. 262, "Le vivant mort." Comp. Maspero, note, p. 32.

‡ Castren, *Vorlesungen*, etc., p. 166.

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needed was that, through means of a rite performed as above stated, the original idol should place its hand upon the back of the neck of the new statue, and, performing the prescribed act, should impart to it its life. After this the new statue could render oracles, heal the sick, perform miracles; in a word, it was placed in full possession of the divine attributes: it was an idol.*

A passage in the *Hermes Trismegistus* shows that this belief, that a god might become incarnate in an artificial body, remained a living faith at least as late as the end of the Alexandrian period. Greece, Judea, Egypt and Asia all contributed a share to what has been aptly termed the extraordinary "intellectual chemistry" which established its principal laboratory in Alexandria, and which revolutionized the world of ideas. Out of these intellectual elements, mixed in different proportions, resulted various religious or philosophical works, which had more or less influence upon their epoch, and many of which represent the expression of as many religious sects or philosophical schools.

Among these works the Hermetic books embody the result of the grafting of the Hellenic spirit upon the ancient Egyptian foundation, and in them we find the antique mode of thought in its last form, and about to abandon its recognized sway over civilized humanity. The portion to which I particularly wish to refer, the Asklepios, was preserved in Latin, and is ascribed to the end of the Alexandrian age. Its doctrine, *i. e.*, the divine unity in its most pantheistic form, the importance of the sun in the works of creation, the apotheosis of the sovereign, whose soul is mentioned as of a higher substance, a certain naturalism which regards all living things, men and animals, as partaking of the same nature, and especially the reasoned idolatry which formally recognizes and explains idols as a natural fact, so to speak, make of these books the last expression of the Egyptian spirit.

In the passage referred to Hermes says:

"The species of gods formed by humanity is composed of two natures: one divine—that is the first and much the purer—the other, which belongs to man—that is the material of which these gods are formed."

Asklepios then asks: "Dost thou mean the statues, O Trisme-

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* Vte. Emmanuel de Roug *étude sur une Stèle Egyptienne Appartenant à la Bibliothèque Nationale*, Paris, 1858, p. 110 and following.

Comp. Maspero, *Rituel du Sacrifice Funéraire*, p. 18.

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gistus?" And he answers: "Yes, the statues, O Asklepios. See, what little faith thou hast. The statues animated, full of sentiment and inspiration; who do so many and such great things; the prophetic statues, who predict the future through dreams and all sorts of other means; who strike us down with disease, or cure our sufferings according to our merits." *

In the anthropomorphism of such a faith the gods, once brought down upon earth, were only superior men; to them were attributed the same feelings, the same needs, that must be catered to in the same way.

Offerings were made to these animated statues; they were purified, dressed, undressed and fed according to, apparently, very much the same ritual as that observed with regard to the dead. Hermes continues: † Terrestrial gods "are accessible to wrath because they are formed and composed by men outside of nature. . . . Their quality consists in divine virtue that naturally exists in herbs, stones, aromatic substances; that is why they like frequent sacrifices, hymns and praise, sweet music recalling celestial harmony; and that remembrance of heaven—conform to their celestial nature—attracts them and retains them in the idols, and causes them to subject themselves to a prolonged sojourn among men."

As may be seen, in all this there entered little allegory: it was idolatry in the narrowest sense of the word.

In the primitive belief that, by means of certain human acts performed with a certain intention, the *life* of an individual or that of a divinity could be compelled to enter a certain medium, through which it might be subjected to human control, we have the explanation of the close relation which the practices and legends of the ancients imply as having existed in their minds between images and the personality of the being represented. By keeping this in view, a long series of legends, and of, to us, seemingly senseless folk-lore, receives a logical explanation: from the waxen serpent made in the image of the evil serpent Apap and inscribed with his name, which the Egyptians burned three times a day in order to avert the possibility of a storm,‡ to the curious Arab legend preserved by Macoudi,

* *Hermes Trismégiste*, Ed. Ménant, p. 146.

† Loc. cit., p. 169.

‡ Pleyte, *Recueil de Travaux*, etc., III., 62–63. The same idea runs beneath many other liturgical acts of the Egyptians. For instance, in order to enable the defunct to overcome his antagonists in the other world, a waxen image

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and according to which Alexander the Great obtained control over the sea monsters, who daily interfered with the building of Alexandria, by having their portraits taken, after which they disappeared and allowed the work to proceed—from the poetic legend of *Pygmalion and Galathea* to the part played in ancient religious mysteries by the dough images of the gods, which were carefully manufactured according to stated rules, and in which, no doubt, the real presence of the deity was thought to dwell. In the Osirian mysteries these dough images were used to represent the body of the dead god;* and it is probable that in the Kawanim which, according to Jeremiah,† the women of Jerusalem made in honor of the queen of Heaven, we have a tradition the origin of which is in a similar way connected with the Adonis mysteries.

The custom is widespread; it is found upon the American continent and is met with among the Greeks and other populations of Europe, in whose folk-lore it still survives in a modified form.

There are in existence some curious Egyptian documents known as the Turin, Lee and Rollin papyri, which date about the twelfth century B.C., and which supplement each other in furnishing the details of certain judiciary proceedings instituted against some dignitaries and members of the household of Rameses III., who were accused of having conspired against the life of the Pharaoh.

In the evidence it appears that one of the conspirators, an officer by the name of Pen-baiben, having, through bribery, possessed himself of a book of magic lore belonging to the royal library, had, with the aid of the potent spells therein contained, and through the medium of small waxen images, obtained full control over the guards of the royal palace with evil designs upon the king. For these nefarious practices he and his accomplices were sentenced to death.

Strangely enough, precisely similar proceedings were instituted in France in 1300 against Guichard, Bishop of Troies, who was prosecuted for having caused the death of Jeanne de Navarre, the queen of Philip IV. It was claimed that at his instigation, and with the assistance of a hermit and a witch, a waxen image had been

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bearing inscribed upon its left arm the name of Apap, the type of evil, was made according to a specific receipt, cut into four pieces and burned. See Deveria, *Catal. des Manuscripts Egyptiens du Louvre*, 1881, VII., 3; No. 5353.

* Victor Loret, *Fêtes d'Osiris au Mois de Choiak.* Rec. de Tr., III. vol., pp. 43–57.

† VII. 18; and XIV. 19.

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made and baptized in due form with a god-father and a god-mother, who called it Jeanne; after which, pins having been stuck in the region of the heart of this image, the queen shortly expired.*

This is by no means the only instance where the magic spell, termed "envoultement," is known to have played a gruesome part in modern history. The most notable instance, however, occurred in 1574, when the King of Navarre, afterwards Henry IV. of France, and his brother, the Duc d'Alencon, became implicated in a conspiracy, as a result of which men of high rank and standing at the court of Charles IX. were imprisoned, racked or sent to the scaffold. The Duke's friend, M. de la Mole, was put to the torture with a view to extracting from him information concerning an attempt made by the conspirators upon the life of the French king, through the means of an Italian necromancer called Ruggieri, the methods used being a waxen image of the king into which a pin was stuck in the region of the heart, to the great detriment of the monarch, then already attacked by the singular disease of which he soon afterwards died.†

This is, I think, interesting as illustrating the persistency of such practices and their revival when the intellectual conditions of a people favor their renewed development; but it also recalls the fact that, although the ancient faith of Egypt received its death-blow at the hands of Theodosius in 381 A.D., its spirit survived long after that date.

We have already found its naturalism lurking at the basis of the Hermetic books, which were held in high authority by the Christian doctors, who turned to them when, in their polemics against the champions of ancient philosophy, they became anxious to find a support for their innovations in the hoary wisdom of antiquity. In the year 400 A.D. the Bishop of Kyrené, Synesios, speaks of the means used by the Egyptians to compel the gods to do their bidding by muttering certain words.‡ The tombs of Beni-Hassan were inhabited until quite late by Christian Copts, who used one of them as a school-room, and left there their grafitti.§ Sais, one of the great religious centers of pagan Egypt, was erected into a Christian bishopric in the third century; it furnished at least one saint and a long line of prelates, among whom some were distinguished lights of

* Henri Martin, *Hre. de France*, Vol. IV., p. 508.

† Henri Martin, loc. cit., Vol. XV., p. 377.

‡ Wiedeman, *Die Religion der alten Ægypter*, p. 145; Munster, 1891.

§ Dr. Graves, *Proc. Royal Soc. of Antiq. of Ireland*, 1891, p. 346.

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the church. It retained its importance as a bishopric until at least the XIth century.* Makrisy, 1360-1442, who mentions it several times, states that its territory included 73 towns without counting its villages.† Many ancient Egyptian temples were used by the early Christians, who established their churches therein; and the Bishop of Limerick, Dr. Graves, has pointed out that Egyptian monks had left traces of their influence upon the early antiquities of Ireland.‡ I believe that when the whole subject has received the general attention which it deserves, it will be found that not only many of the ancient symbols and religious usages of Egypt found their way into Europe through the African church; but that much of its magico-scientific lore indirectly penetrated there afterwards with the close intercourse which the Mohammedan conquest, the crusades and the establishment of Western principalities in the east brought about. We must not forget that the very name of the black art—alchemy—points to such an origin.

However this may be, the whole order of such practices as imply a belief in the possibility of controlling a spirit, or have for object the bringing down of the real presence of a divine life or of a human personality into a manufactured object, through which control may be obtained over the *life* thus become incarnate, may be regarded in the light of secondary or tertiary formations at the basis of which lies the phase of human thought whose origin must be sought in a survival of primary fetichism.§ And this, as we have seen, we find, as it were, crystallized in the archaic Egyptian rite which we have just been considering.

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* Mallet, *Culte de Neit à Sais*, p. 65.

† Quatremére, *Mémoire Géog. et Hist. sur l'Egypte*, I., 291.

‡ Dr. Graves, *Proc. of the Royal Soc. of Antiq. of Ireland*, 1891, p. 346.

§ Many non-civilized people object to allowing their portraits to be taken, or even to telling their names, for fear of a certain occult power being obtained by this means. See Réville, *Revue de l'Histoire des Religions*, Vol. VI., p. 94.

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A CHAPTER OF ZUÑI MYTHOLOGY.

BY MATILDA C. STEVENSON.

AT a time when all nations are agitated by the celebration of the discovery of a new world by Columbus, it seems peculiarly appropriate to study the character of the people occupying this continent upon his landing. To those interested in the humanities this glorious picture of discovery is marred with a touch of pathos that a race spreading in such numbers over our territory, a race which could never be subjugated into slavery, has, during these four hundred years, been driven before the progress of civilization, not only from their homes and hunting-grounds, but from the very presence of their gods. Those who know that with these peoples almost every act of life assumes a religious character, and that every mountain of their land, every river, every spring is directly associated with their gods, must feel sympathy for them and wonder at the magnanimity they have shown their white oppressors. The American race was divided into many tribes, speaking many languages and many dialects, and there are still many such divisions, but numbers of tribes in our territory have become amalgamated by coming into closer proximity as they were driven before the white race, while other tribes have passed away.

A number of tribes of our Southwest are termed pueblo Indians, living in houses built of stone and adobe.

Explorers of the past decade have enlightened the world with their discoveries of pre-Columbian ruins distributed over portions of Colorado, Utah and the entire area of New Mexico and Arizona. These ruins have been classified into five groups: the valley, cliff, cave, cavate and mesa ruins. The valley or plain ruins, once the homes of agricultural peoples, cover New Mexico and Arizona. Here they lived until, driven by a powerful foe from their happy homes along the water-courses and by the springs, they sought refuge in cliffs and caves of canyon walls. Wherever in that arid land a fountain of water is to be found there stands a pueblo or the ruin of a pueblo. This mystic land reveals to the archæologist a touching tale; the niches in the canyon walls are filled with the fame of the cliff-dwellers, and we rebuild in imagination the worshiping-places

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and homes whose ruins remain the mute yet eloquent witnesses of a people long passed away. Many of the cliff buildings are in a good state of preservation, while the valley homes of long ago are but heaps of stones; about these ruins are scattered the fragmentary lares and penates of a remote civilization.

It has not been determined how many generations of cliff-dwellers lived in these strange retreats. Some of these places have long since become inaccessible, owing to the wearing away of the approaches by the same elements that fashioned the recesses of the canyon walls which served as foundations for their worshiping-places, fortresses and homes. When the cloud of war grew less foreboding these people ventured from the lofty abodes, where their trials and privations had been great, and built themselves homes on mesas—flat-topped mountains or table lands. The difficulties of the mesa life imposed a great tax upon the people; the fields of grain were far away on the low lands, and the maidens grew weary carrying water up the steep acclivities from the springs below, and after a time many of the inhabitants returned to the plains and valleys, erecting dwellings upon the ruined towns of their forefathers, thus completing a cycle; and many such cycles may have occurred. The Tusayan Indians of Arizona, a group of the Tewan and the Acoma of New Mexico are the only tribes now living upon these high plateaus in our own territory; but cliff-dwellers still exist in remote regions of Mexico.

The earliest history we have of the pueblo Indians dates back to the year 1530. Spanish adventurers penetrated the country and returned with extravagant accounts of these people and their wealth; and a series of general and systematic invasions followed for their conquest, and these continued from time to time until the Hidalgo treaty of 1848. According to the accounts of the invaders there were between eighty and one hundred of these pueblos; at present there are some thirty-two. The villages are all of the same general type. The people, although possessing common characteristics and following similar pursuits, and although strikingly alike in physical structure, belong to four distinct stocks: Shoshonean, Keresan, Tanoan and Zunian. It is of the Zuni that I shall now speak.

The tribe is divided into clans, descent being through the maternal side, and though the children in a sense belong to the mother, the father is far from an unprivileged person, and his position toward the child is hardly less important than the mother's. One must not

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marry a member of the mother's clan, neither is it admissible to marry into the father's clan. I have witnessed more than one love-making in Zuni, and in essentials it does not differ widely from that experienced by our own youths and maidens. I call to mind a couple whose love was not sanctioned by the girl's parents, and, though they determined that she should not meet this lover, she managed to glide by the well to her trysting-place each day at eventide, the hour when the maidens gather to fill their water vases, which they carry, Egyptian-like, upon their heads, and when they exchange their bits of gossip. When I discovered them one autumn evening in the gloaming the youth was endeavoring to take the maiden's hand, and she was objecting with her lips, but bidding him take courage with her bewitching eyes, whose luster the shadows of evening could not veil.

There are many real love matches, while others are prudential marriages, which are, of course, arranged by the elders of the girl's family. It has been suggested that in Zuni the girl takes the initial step in love-making. On the contrary, these people hold such forwardness on the part of their women much as we regard the husband-seeker. The woman indicates her satisfaction at the call of a suitor by offering him a draft of cool water and food. If she hesitates, owing to her uncertainty or her coquettish desire to excite anxiety within the breast of her lover, she is reminded of her duty by either the father or mother, should the young man be desired for a son-in-law.

While their system of government is characteristic of a primitive state of culture, it is, nevertheless, quite complete as far as it goes, meeting the requirements of the established authority. While we profess to mete out justice to the accused, primitive law makes no such pretension. The rich and prominent man is favored; the poor and despised must suffer to the full extent of the law. The governor, who has a staff of assistants, is ex-officio the judge, before whom are tried all persons charged with ordinary offenses. In more important cases the six *Abshiwanni* (rain-priests) are present and interfere if in their judgment the governor fails in a proper decision. Witchcraft is always tried by the priest of the Society of the Bow and his associates. The chance for a sorcerer's life is the relating of some marvelous story sufficient to impress the judges of his occult knowledge of medicine.

The earth is watered by the deceased Zuni of both sexes, who are controlled and directed by a council composed of ancestral gods.

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These shadow-people collect water in vases and gourd jugs from the six great waters of the world, and pass to and fro over the middle plane, protected from view of the people below by cloud masks, the clouds being produced by smoke; and when it is understood that, the greater the smoke offering, the greater the inducement for the rain-makers to work, it is not surprising that smoking is one of the conspicuous features of Zuni ritual.

The Ahshiwanni, a priesthood of fourteen men who fast and pray for rain, the Kokko, an organization bearing the name of anthropomorphic beings (principally ancestral) whom they personate, and thirteen esoteric societies are the three fundamental religious bodies of Zuni. It must be borne in mind that the religion and sociology of these people are so interwoven that the one cannot be studied without the other.

The Society of the Kokko personate anthropomorphic gods by wearing masks and other paraphernalia. There are six estufas or chambers of the Kokko for the six regions: the north, west, south, east, zenith and nadir, and these rooms present fantastic scenes when the primitive drama is enacted by the personators of these anthropomorphic gods. The costumes worn at such time are quite elaborate and of artistic design. As soon as the mask is donned the actor loses his identity as a man, his body becoming the abiding-place of the god he personates.

The esoteric societies, with but one or two exceptions, have nothing to do with anthropomorphic beings, this category of gods being zoomorphic. These societies deal essentially with the anagogics of medicine, feats with fire, knives, arrows and general legerdemain.

The medicine practices are for extracting disease inflicted by the sorcery of men or of the lower animals. The other performances are to bring rain and snow. No society convenes without giving much time to invocations for rain, not, however, appealing directly to the sun-father, their supreme deity, and to the rain-makers, as the fourteen rain priests do, but to the beast-gods of their worship, to intercede with the sun-father and rain-makers.

A complete system of rain cult has been instituted by these people of an arid land, for in a region where the rain seldom falls the greatest boon to man seems to come from the clouds. At the winter and summer solstices synchronal meetings of most of these societies are held, and also at other times. The members of a society meet for a number of nights previous to the ceremonial to rehearse their

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songs, which, however, are not begun until late in the evening, the earlier part being devoted to relating epic stories—at least this used to be the custom, but at the present time the glowing accounts of the feats of their war-gods and experiences with the hated Navajo have been replaced by tales of the wrongs suffered at the hands of the white man. The women and children as well as the men are devotees in their observances of the practices of their societies.

The Zuni are an agricultural and pastoral people, maize being their staple article. Every color and shade of corn may be found, these primitive agriculturists having observed the greatest care in the development of varieties. The reds range from the richest cardinal to the faintest blush of pink, and a similar variety of shades runs through the blues, yellows and purples. They have pure white and black, and the variation in the individual ears is remarkable. Almost the same variety of color is to be found among the beans. All this care of propagation has a religious significance. They do not attribute the introduction of cattle, horses and sheep to Europeans, but to the creative power of their culture hero.

It is only by long and intimate relations with these people that one may gather correct data of their religion and sociology. They are so hospitable, so ready to serve others in many ways, yet so reticent, so diplomatic, that one might live much in their midst without knowing anything of their real life.

Zuni is built upon a knoll in a broad valley walled by picturesque mesas of red and white sandstone, and on the site of a village which they deserted during a flood to flee to a mesa near by for safety, according to their account. Although this table-land is several hundred feet above the valley, yet, according to Zuni tradition, the waters reached nearly to the summit of the mesa, and in the dire extremity the rain-priests determined to sacrifice a youth and maiden in order to propitiate the angry waters. The two were dressed in their most beautiful clothes and adorned with many necklaces of turkis and other precious beads, and cast into the waters. The offering stayed the calamity, and the victims were turned to stone, and are to be seen in a columnar rock broken near the top into two parts which are capped with head-like forms. These are called the father and mother rocks. This reference to the casting of the two into the waters leads to the inference that at some period in the past human sacrifice was practiced by these people.

Zuni is the name given by the Spaniards; they call themselves

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"Ah-shi-wi," meaning all people, reference being to themselves alone.

The natural impulse of the human mind is to seek for truth and to account for the phenomena of nature, and thus philosophy grows. Mythologic philosophy is the fruit of the struggle for knowledge of cause. The reasoning of aboriginal peoples is by analogy, for at this stage of culture science is yet unborn. So the philosopher of early times is the myth-maker. The philosophy of primitive peoples is the progenitor of natural religion, and religion is invented through long processes of analogic reasoning. The Zunian belongs to this stage of culture. He is conscious of the earth he treads upon, but he does not know its form; he knows something of what the earth contains beneath its surface, of the rivers, the mountains, the sun, moon and all celestial bodies of the solar system to be discerned without the optical inventions of man; he sees the lightning, hears the thunder, feels the winds and knows the value of rains and snows; he is acquainted with the beasts of the forests, the birds and insects of the air, the fishes of the rivers, and knows that these living things possess attributes not attainable by himself, and so he endows these animals with superior or supernatural qualities. When one becomes ill from any other cause than that of a wound it is attributed to some foreign element thrust into the body and beyond his power to overcome. Nothing is left him then but to appeal to the creatures of superior qualities, and thus a system of theurgism develops, when religion and medicine become a sort of dualism, for the animals of his worship are his doctors, acting through the agency of the theurgist. These theurgists are the destroyers of evil inflicted by sorcery; they have no power within themselves to avert such evil; in dealing with sorcery of man they must first become entirely under the influence of the beast-gods of the cardinal points—the Zuni having relegated the cougar to the north, the bear to the west, the badger to the south, and the white wolf to the east. Now, in order that the theurgist should heal his patient, this foreign object in the body must be extracted, and the means adopted to this end is curious. The lips are applied to the flesh, and the disease is drawn out by sucking. This process of sucking to cure disease is not confined to the Zuni, but is common among aboriginal peoples of the world, differing only in minor details.

A theurgist must be a person regularly initiated into a medicine order of a secret society and may be either man or woman. All but one or two of the thirteen esoteric societies comprise several orders, that of medicine being considered the most important division.

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Though young children of both sexes enter this order, they do not practice healing until in the opinion of elder theurgists they have reached years of discretion, when they become members of the first degree. At these ceremonies of initiation a sand-painting is one of the prominent features. A ground color of sand is laid upon the floor in front of the slat altar and made perfectly smooth, and upon this figures are delineated by sprinkling powdered mineral pigment from between the thumb and fingers. These paintings, of more or less elaborateness, are common among all the pueblo Indians, the Navajo, the Mission Indians of California and tribes of the north, and are all used in connection with medicine practices. I cannot say how widespread the observance of sand-painting is, but the low-caste people of India design their gods in sand paintings on the ground by sprinkling in the same way, and they also have sprinkling-cups for the purpose. Unlike our Indians, they do not have a ground color of sand, but spread the surface with diluted chips of the sacred cow. The high castes have greatly elaborated the sand-paintings, which are used by them purely for decoration. This same feature is to be found in the Renaissance, when the tables of the French were bordered in elaborate designs with powdered marbles. If I have digressed from the main subject it is because it seems a point of interest to note at what remote regions of the globe the custom of sand-painting is observed.

It has been mentioned that the mission of the theurgist, acting as the agent of the beast-gods, is to extract the object which causes disease, and much sleight of hand is brought into practice, especially at regular meetings, when patients gather in large numbers in the ceremonial chamber to be healed of real or imaginary disease.

Our concepts of the universe are altogether different from those of primitive man; we understand natural phenomena through philosophical laws, while he accounts for them by analogy; we live in a world of reality, he in a world of mysticism and symbolism; he is deeply impressed by his natural environment, every object with him possessing a spiritual life, so that celestial bodies, mountains, rocks, the flora of the earth and the earth itself are to him quite different from what they are to us. The sturdy pine, delicate sapling, fragrant blossom, giant rock and tiny pebble play alike their part in the mystic world of aboriginal man. Many things which tend to nourish life are symbolized by the Zuni as mother. When the Zuni speak of the earth-mother, they symbolize the earth as the source of all vegetal matter which not only nourishes man, but which also supports the

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game which gives animal food to man. The earth is mother, the great one to whom they are indebted for sustenance. Ancestors are passing to and fro over the middle plane hidden by the cloud masks. The character of the clouds influences Zuni thought concerning them. If the clouds are white and fleecy the shadow-people are passing about for pleasure. Heavy rain clouds indicate that the shadow-people will water the earth; but there is a proviso. The smoke offerings which produce the clouds may have been sufficient, but this is not all: the daily life, especially of their priests, must be such as not to offend the council of ancestral gods which controls and directs the rain-makers, for, should such be the case, the council would withhold its power, and, in doing so, would leave evil-beings free to use their power, and those who send the cold winds would drive away the cloud masks. Thus the Zuni account for wind clouds.

These people rarely cast their eyes upward without invoking the rain-makers, for in this arid land rain is the prime object of prayer; their water vases are covered in cloud and rain emblems, the water in the vase symbolizing the life or soul of the vase.

The cereals distributed by the personators of ancestral gods are recognized by the intelligent as symbolizing only the blessings which they desire and anticipate, yet each person receives the gift with the same solemnity, and plants it with the same reverence as if it actually came from the god of cereals in the under world. While their gods preserve from evil they also bring evil; they bring plenty or want at harvest time. Thus the gods are supposed to hold within their power all prosperity and all adversity, and by means of ceremonies and many prescribed observances the gods are induced to preserve from evil and bring happiness. Thus the daily life of the Zuni is so controlled that every act of life assumes something of a religious character, and although their religion is fraught with much fear, and although their trials and hardships in the observance of the cult in which all their hopes and ambitions are centered are many and severe, from early childhood to old age, they feel great pride in the long and tedious rituals of their esoteric societies, and real joy in personating their anthropomorphic gods when they join in the rhythm of song and dance.

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THE RELIGIOUS SYMBOLISM OF CENTRAL AMERICA AND ITS WIDE DISTRIBUTION.

BY FRANCIS PARRY, F.R.G.S. (ENG.)

[Abstract.]

AFTER referring to the saying of the Mayas that "they were the sons of the trees," and stating that the tree emblem existed among the sacred forms reverenced later by the Aztecs, who designated it "the tree of our life," or "the tree of our flesh," the paper mentioned that the emblem is observable in each division of the Maltese cross calendar of the hieratic manuscript of the Mayas known as the Fejerday Codex, in closest association with the cherished emblems of their religion. It was stated further that the two living principles or natural forces displayed separately on the slab from Palemke, deposited in the National Museum of Mexico, the life of man and the vegetable kingdom, are on the sacred Maya Stone of Mexico each assigned a place. In the cruciform, almost tree-like form of the larger so-called altar slabs of Palemke, they are combined; as the *Aban*, the lord of the life of men, is a part of the stem and is dove-tailed into one piece with a symbol universally employed to represent vegetation or the force producing it. The Maya hieratic symbol *Aban* embodies the three principles of life, those found in the sexes and the vegetable germ, the former comprising the continuity of the existence of men, animals, insects, and the inhabitants of the air and water. It is common in the manuscripts, and is freely employed as a hieroglyphic and as a symbol. When used as a hieroglyphic, the *Aban* frequently has its three dots removed to the outside lower edge, and they are used alone either grouped in a triangular or in a lineal manner, and may be observed in multiples or as the original three on the majority of the Maya monuments, where they denote *plenty*, *fecundity*. The three-dot symbol may be seen on the Costa Rica and Zuni pottery, and on native stones for grinding corn in actual use by the mission Indians of California, in the latter instance undoubtedly denoting "abundance," or a desire for it.

Another symbol occasionally occurring appears to accord with part of the sentiment expressed by *Aban*. It closely resembles the Chinese sign which symbolizes the two natural forces, the Yun and

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the Yin, the male and the female. The symbol is on a Santa Lucia slab now in the Berlin Museum, and is among the symbols on the monoliths of Copan, the largest known being there on a circular so-called altar five feet in diameter, where it covers the entire mass, with the exception of a serpent border.

Yet another symbol occurs synonymous with these. It is taken from the form of a springing calibash plant, that is, the erect sprout, and is employed oftentimes in the place of *Aban* to portray the three principles of life. The renowned Palemke cross has this rival emblem incorporated into its stem; a large specimen in sculpture is among the recent acquisitions at Cambridge, Mass.; and it survives among the Aztecs. The Copan stellæ are really the representations of the emblems, three in number, here treated of, with varieties of them, massed together, in combination with other two principal emblems and their varieties.

The fourth emblem was the sun, the heat-and-light-giver. His symbols were in many cases masks, and throughout the whole central region these were worn by the priests on certain occasions until recent times. One sculptured form of mask had a shape so like a skull as to be mistaken for one. Another skull-like mask is, both in the manuscripts and in carving, shown with clawed feet, an accompaniment quite in order with the historical development of the symbol as recorded on the sacred stone.

Lastly, an equal-limbed cross, of the Greek form, was worshipped by the natives of Merida, and at Palemke was another cruciform, on the slabs of a temple or shrine built on a pyramid, which had the semblance to the true cross, because, although of equal limbs, it overlaid, or rather was incorporated into, the tree form. The Palemke cross has arms, the terminals of which are grecques that with grotesque contortions make the heads of serpents. The Greek cross and the serpent were inseparable and manifestations of one idea, both being symbols of the God of the Air, who was personified by the rattle-snake, and obtained the appellation of the Plumed Serpent.

In conclusion, the paper stated that unanimity marks the ancient people of America in the matter of religious belief, and that in surveying the past history of the religion of the Five principles, there is some satisfaction in claiming for it a distinct place, and being able to come to the conclusion that it is of independent growth and purely American.

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MUSEUM COLLECTIONS TO ILLUSTRATE RELIGIOUS HISTORY AND CEREMONIALS.

BY CYRUS ADLER.

MUSEUM collections perform a double function. They instruct the public and they furnish material for the investigator. They render the reading of books more intelligible, and their writing more accurate. Infinitely more than the popular illustrated magazine or scientific monthly are they the means of communication between the average man and the scholar.

The study of religious history and ceremonial institutions stands on a footing different from that of any other branch of knowledge. Political history, though in a lesser degree, suffers under similar disadvantages.

The study of biology or the physical sciences is approached with no predisposition. Their terminology is arbitrarily given, and the errors of their followers are due to infirmity of the powers of observation or generalization.

The study of political history, no matter how scientific the spirit in which it be approached, is influenced by an emotion—that worthy emotion known as patriotism, for which men sacrifice life, health and fortune. An emotion even stronger is religion; its influence is second only to that of domestic affection, and sometimes overcomes it; its lessons are the earliest instilled into the mind; none escapes its influence. Even with unusual precautions in the case of a human being bereft of most of the avenues of perception religious teaching could not be excluded.*

All modern literatures presuppose a definite belief, and the creeds which differ therefrom are described in terms which carry a derogatory implication.†

It is obvious, therefore, that if the public is to be taught the history of religion or religious ceremonies, it will be most advisable

* Laura Bridgman.

† This sometimes occurs as a result of scientific prejudice; witness the placing by Paolo Mantegazza of many religious objects under the headings of *superstition* and *cruelty* in the Museo Psychologico at Florence.

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to approximate the methods of those branches of study in which the knowledge is acquired for its own sake, without thought of professional use or partisan advantage, simply for the enlargement of the mental horizon of the individual, and the increased mental power thereby attained.

Modern investigation and modern teaching are based upon phenomena. Science deals with objects and phenomena; it collects them, describes them, and classifies them. A few great men in the world generalize; speculation, acknowledged to be such, is out of fashion.

This tendency of investigation to deal with phenomena has reacted upon all forms and grades of instruction, the higher as well as the popular. It has given the impulse to and shaped the growth of the highest modern method of popular instruction—"the most powerful and useful auxiliary of all systems of teaching by object lessons," *—the educational museum.

Religious history and ceremonial have been the very last to profit by the awakened impulse acquired through the museum and the general exhibition.

The first museum established solely for the collection and preservation of objects having to do with religion was the Musée Guimet, founded at Lyons in 1879 by M. Emile Guimet, on his return from the mission entrusted to him by the French Ministry of Public Instruction, to study the religions of the extreme Orient. The collection thus assembled is the largest and best single collection of objects relating to religion ever put together. It has occasioned the publication of a series of volumes which form by far the most remarkable contributions yet produced to the scientific study of religions.

In 1885 this museum was removed to Paris, a special building erected for it, and it is now included among the series of museums under government control.

But, in spite of the splendid character of the collections and the great impetus they have given to scientific research, the Museum has serious weaknesses which should not be overlooked. The general classification as well as the special arrangement are defective from the point of view of a museum of religions.

Geographical considerations have dictated the general classification, so that the Chinese, Japanese and Indian Buddhism, for example,

* Dr. G. Brown Goode, *Museums of the Future. Report U. S. National Museum, 1889*, p. 427.

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are shown out of relation to one another. Æsthetic considerations have directed the arrangement of the groups themselves; the special objects are in the main without labels, making the use of the printed guide, always tiresome and distracting, an absolute necessity for the general visitor. So strongly has the æsthetic arrangement predominated that I am informed the character of the museum is to be changed, and that in future it will be devoted to Oriental art.

The most serious fault of the museum, however, is that it fails to furnish an intelligent train of thought to the mind of the average visitor. The real method of popular education consists in imparting the unknown in terms of the known. Just as the scientific investigator obtains results by the comparison of facts and phenomena, does the museum visitor have his interest awakened by the opportunity of comparing familiar objects with those brought to his knowledge for the first time. From the point of view of popular education it is, therefore, a capital error that the Musée Guimet has not included the Christian religion, as well as the Mohammedan and Jewish religions, with which the first named has such close affiliations, in the series which it places on exhibition. Many museums contain objects which would find place in a collection of religions. These are usually installed in ethnological exhibits, and more frequently still are shown as objects of art.

In a few museums religious art is treated as a distinct subject, and, being arranged chronologically, may be considered as showing the development of both church history and religious symbolism. The most important of these is the Lateran Museum at Rome. In 1843 Pope Gregory XVI. set apart the Palazzo del Laterano as a museum for heathen and Christian antiquities, styling it Museum Gregorianum Lateranense. The Christian Museum was founded by Pius IX. It contains a most valuable collection, including a series of early Christian inscriptions arranged by De Rossi.

The National Bavarian Museum at Munich contains a rich collection of Christian ecclesiastical art, as well as a goodly series of Jewish religious objects.

The Arab Museum in Cairo, although not erected from the point of view of religions, is yet to a considerable extent a collection of Mohammedan ecclesiastical art. Its purpose is the preservation of monuments of Arab art, but, as the mosque was the chief inspirer of

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elegant work, most of its objects are directly or indirectly related to Mohammedan worship.

The U. S. National Museum contains Buddhist objects from India, Siam, China, Corea and Japan, as well as considerable collections from Polynesia—the result of the Wilkes Exploring Expedition. In the Department of Ethnology much attention has been paid to collections of objects of religious import employed by the aborigines of North America, and special series, as, for instance, mortuary customs, have been for some time on exhibition.

As a result of the travels of Mr. W. W. Rockhill in Thibet, the National Museum secured a rich and unique collection of the religious objects of the Buddhists of that little known country.

In 1889 a collection of objects illustrating Jewish religious ceremonial was placed on exhibition, and in his report for that year Dr. Goode announced the purpose of the museum to form a collection which would illustrate the comparative history of religion.

Having found a place in the museum, it was but proper that the subject of religion should be assigned space in the great exhibitions, and that in the natural course of events special exhibits of religious objects should be made. These exhibits are quite distinct from the church exhibits—either from the point of view of propaganda or philanthropy—which have usually been included in exhibition classifications.

A special religious exhibition of considerable importance was the Esposizione Vaticana, held to commemorate the jubilee of Pope Leo XIII., from December, 1887, to May, 1888. It took place in the Basilica di San Pietro e Palazzi Vaticani, and its story is told in a serial publication, *L'Esposizione Vaticana Illustrata Giornale Ufficiale per la Commissione Promotrice*, as well as in a valuable catalogue.*

While not exclusively religious, the exhibition was in the main an exhibit of the Roman Catholic religion, although costumes of other religious functionaries were admitted.

In the same year there was held in London, in honor of the Queen's jubilee, the Anglo-Jewish Historical Exhibition, in which the richest collection of Jewish ceremonial obiects ever got together was placed on exhibition.

At the Paris Exposition of 1889 the Society of Anthropology of

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* See Appendix No. 1.

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Paris included a history of religions in its classfication, with the subdivisions of Amulets and Divinities. Amulets, however, were given most attention.

In April, 1892, a loan exhibition of objects used in religious ceremonies and charms and implements for divination was held at Philadelphia under the auspices of the Department of Archæology and Paleontology of the University of Pennsylvania.

A useful catalogue of this collection (edited by Mr. Stewart Culin) was published. The classification followed the Musée Guimet, and was geographical in the main, though not strictly so.* A decided improvement on the Musée Guimet plan was the admission of one of the great Semitic religions—Mohammedanism.

In the Columbian Historical Exhibition at Madrid (1892), 7,000 square metres were devoted to a splendid exhibit of Christian ecclesiastical art, arranged by cathedrals.

The Chicago Exposition has made considerable advance on its predecessors in this regard. Two exhibits of religions are to be found here—one in the Ethnological Building and one in the U. S. Government Building. On the Midway Plaisance there is a mosque in charge of an Imam, officially appointed by the Sultan of Turkey, in his capacity of Caliph, *i. e.*, successor, or rather substitute of Mohammed—the title of the head of the Mohammedan church.

A Parliament of Religions has been called which, while conducted on church lines, and almost exclusively from the propagandist or philanthropic point of view, yet possesses a certain interest, in that it enables the presentation of many creeds by their own professors. Of the exhibits I shall not speak in detail, as the Congress has set apart a special day for visiting them, yet I may be pardoned for making a few general statements covering the exhibit in the Smithsonian Section.

Some time before the plans for the National Museum exhibit were under way, the purpose of forming a section devoted to comparative religion had been definitely announced. It was accordingly decided to prepare a type exhibit for the World's Fair. This exhibit suffered under limitations as to space and time for preparation. It was further decided to limit the religions shown to a selection of the nations inhabiting the Mediterranean. This selection had a conscious

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* See Appendix No. 2.

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significance already referred to in the discussion of the Musée Guimet, which is of considerable practical value for the advance of the study of religions in America. The Mediterranean basin has been the seat of the civilizations of the modern western world. The art, philosophy and religion of Europe and America arose among the ancients of that region, and the highest ideals even of the moderns are still to be found in the books and the works of art of those ancient peoples. In an attempt, therefore, to introduce the study of religions into universities, or to create departments of religious ceremonial in museums, it behooves us for the nonce to put aside the American, Indian and the Central African, and to begin at least with those religions whose history has an interest for all men of our day, the knowledge of which should really become a part of general culture.

The exhibits comprised the following religions: Assyro-Babylonian, Jewish, Oriental Christian, Mohammedan, Greek and Roman.

It is expected that in the coming year a collection of religious history and ceremonial institutions will be installed in the National Museum. For the present, museum economy will render it necessary that objects relating to the religion of the aborigines of North America be retained in the general ethnological exhibits, though they will be carefully differentiated.

With that exception, the museum collections already referred to, those on exhibition at the Exposition and some recently acquired, will be labeled and installed as soon as practicable. So fully is the importance of this subject recognized that, in spite of the great pressure for floor space at the museum, adequate room will be provided, although it will require the retiring of some interesting collections.

Religion consists in what men believe concerning the supernatural and what they do in consequence of that belief—in creed and cult.

It is the cult which most readily lends itself to museum exhibition, and this will be taken up first, although there are devices by which even creeds may be shown in museum collections.

The objects will be exhibited in religious groups and not in any geographical relation, except in so far as the worship has actually been affected by geographical considerations.

The cult objects will be arranged under certain well recognized heads.

There is usually a public worship in which the sacerdotal and lay classes have definite functions; there are places of worship with

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furniture and appointments, symbols about them and shrines within them; there is the sacerdotal person, his costume and the implements he employs; the sacred writings, the altar or its equivalent; the special public religious occasions, such as feasts; the public religious ceremonies on special occasions that affect the community—as wars, triumphs, distress, famine and drought.

The relation of the individual to the cult will come next in order —marriage, birth and death, in some cases betrothal; ceremonies at certain ages, more especially of the attainment of puberty; the relation of religion to the organized community, state religious observances; finally the secret religious practices among which charms and divination would probably fall.

Such collections once made for the individual religions, certain groups of ceremonies will be taken up in the hope that a comparison of the underlying ideas may form a fruitful subject of study.*

A double purpose would be served, for instance, by an exhibit of sacred books, which would furnish an opportunity for the classification of the book religions. This may be followed by a collection to illustrate the altar and sacred enclosure. Another subject that would lend itself to such a comparative collection would be votive offerings; still another would be music and musical instruments; mortuary and marriage customs, and many other subjects will readily suggest themselves.

I cannot do better than quote a sentence from the suggestive article of Prof. Jastrow † as expressing the aspirations of the National Museum in this connection: "With the admirable facilities possessed by a government institution," he says, "for obtaining objects from all parts of the world, the scope of this section ought at an early day be made co-equal with the universe."

The study of religions is one by no means narrow, but full of significance for the historian and anthropologist. The greatest movements in political history have either been occasioned by or resulted

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* How effectively this may be done as a matter of investigation, has already been shown by the study of sacrifice among the Semites by Prof. W. Robertson Smith in his work, *The Semitic Religions: Fundamental Institutions*, the most notable contribution to the study of Semitic religions which has ever been made.

† *Biblical World*, Jan., 1893, pp. 24–32.

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in religious movements; and these are not infrequently stereotyped in some religious ceremony.

It is no exaggeration to say that the history of the Roman Church, as well as the history of the church symbolism, might be studied in a collection of Papal medals; yet, so far as I am aware, no attempt has ever been made to form such a collection.

As Dr. Brinton has pointed out, religion has had much to do with the growth of the arts and forms of government.*

A subject of such wide import and so great general interest ought rapidly be admitted to our museums, find a place in the curriculum of our universities, and gain an entrance to all the avenues of public instruction.

APPENDIX I.

CLASSIFICATION OF OBJECTS RELATIVE TO CATHOLIC WORSHIP AND RELIGION.

GROUP I.—WOVEN GOODS.

1st Class.—White Goods.

Principal objects: Amices—Albs—Cinctures—Corporals—Palls—Purificators—Handkerchiefs—Finger Towels—Altar Linens—Communion Cloths—Surplices and Rochet-towels for the Sacristy, etc., etc.

2nd Class.—Colored Goods.

Principal Objects: Chasubles—Stoles—Maniples—Chalices—Veils—Burses for Chalices (colors: white, red, green, violet, black, and gold and silver cloth)—Cushions for Missals—Dalmatics—Copes—Veils for Sub-deacon—Coverings for the Bench in Solemn Masses—Coverings for the Missal in the same Solemn Masses—Canopy or Altar Coverings—Burse for Pyx—Veil for Pyx—Veil for Processions—Altar Coverings—Carpet or Cloth for Altar Steps—Covering for Immovable Lecturns—Covering for Movable Lecturns—Cloths—Arras-Veils, etc., to adorn churches—Artificial Flowers in silk, cloth and talc—Pennants—Banners, etc.

GROUP II.—OBJECTS IN METAL, WOOD, ETC.

3rd Class.—Vessels of Metal.

Principal Objects: Chalices (cups of gold and silver gilt)—Patens—Vessels for Hosts (*i. e.*, Ciboriums)—Little Basins for Cruets—Peace Instruments—Pyxes—Ostensoria—Vessels for Purifications—Vessels for Water to be Blessed—Portable Vessels for Holy Water—Vessels for Oil for the Lamps—Vessels for the Holy Oils—Vessels for washing the hands in the Sacristy.

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* *Iconographic Cyclopedia*, Vol. I., 141.

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4th Class.—Furniture of Various Kinds.

Principal Objects: Crosses for Altars—Processional Crosses—Crosses for the Sick—Chandeliers for Altars—Triangular Chandeliers—Chandeliers for the Pascal Candle—Altar-Cards—Antependiums—Missal-stands—Censers—Incense Boat—Umbrellas and Canopies—Wooden Boxes for Chalices—Case for Ostensoria—Folding Seats—Bishop's Chairs—Fold-stool (*i. e.*, unofficial episcopal throne)—Kneeling Benches—Pulpits—Official Throne of Bishop—Gates—Wooden Altars—Cornices, etc., etc.

5th Class.—Glass.

Principal Objects: Cruets—Vessels for Purifications—Lamps—Colored Glasses.

GROUP III.—BOOKS.

6th Class.—Books for Worship.

Principal Objects: Missals—Psalters—Graduals—Antiphonaries—Breviaries—Martyrologies—Rituals—Pontificals—Ceremonials, etc., etc.

7th Class.—Religious Books.

Principal Objects: Theological and Catechetical Works—Moral and Casuistry—Philosophy—Ascetic Works—History—Biography—Apologists—Liturgies—Sacred Archæology and Epigraphy—Reliefs and Monographs of Sacred Monuments now existing—Religious Journals and Periodicals, etc., etc.

GROUP IV.—FINE ARTS AND THEIR AFFINITIES.

8th Class.—Architecture.

Principal Objects: Plans and Designs for Churches, Chapels, Altars, Baptistries—Small Models—Designs of existing Churches—Designs and Plans for Restoration of Churches, etc., etc,

9th Class.—Painting.

Principal Objects: Altar Pieces in oil, encaustic, distemper—Miniatures, etc., etc.

10th Class.—Sculpture.

Principal Objects: Statues—Groups—Bas-reliefs—Wall Decorations and Sacred Furniture (in marble, metal, wood, terra-cotta, cement, scagliola, stucco) etc., etc.

11th Class.—Music.

PART FIRST.

Principal Objects: Treatises on Religious Music—Collection of Ancient Religious Music—Modern Church Music, etc.

PART SECOND.

Principal Objects: Organs—Harmoniums—Bells, large and small, etc., etc.

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12th Class.—Affinities.

PART FIRST.

Photography, Silography, Lithography, Engravings in Steel and in Copper, Seals, Mosaics, Plaster, etc., etc.

The reproduction of Devotional Objects—Sacred Images—Monuments, etc.

PART SECOND.

Small Devotional Objects, as Rosaries, Medals, Crucifixes, etc.

PART THIRD.

Different Products: Wax—Oil—Wine—Incense, etc.

JOHN ACQUADERIN, *President.*
JOHN DONINI, *Secretary.*

BOLOGNA, *January 31st, 1887.*

APPENDIX II.

CLASSIFICATION OF UNIVERSITY OF PENNSYLVANIA EXHIBITS OF RELIGIONS.

Ancient Egypt.
Religions of India.
- Sectarian Brahminism.
- Buddhism.
- Jainism.

Religions of China:
- The State Religion.
- Confucianism.
- Worship of Ancestors.
- Taoism.
- Buddhism.

Thibetan Buddhism.
Religious Ceremonies of the Chinese in the United States.
Japan:
- Shintoism.
- Buddhism.

Mohammedanism.
American Religions:
- Northwest Coast.
- United States.
- Mexico.
- Yucatan.
- San Domingo.
- Peru.

Polynesia.
Bantu Tribes.

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LINGUISTICS.

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LINGUISTICS.

THE PRESENT STATUS OF AMERICAN LINGUISTICS.

BY DANIEL G. BRINTON.

[Abstract.]

THE survey of American linguistics which I shall present to you shall have as its chief object the indication of the fields which have been least cultivated, and which, for this reason, demand the closer attention of future workers.

In the extreme north, the various Eskimo dialects have of late been studied by a number of competent observers, and their relationship rendered more clear, while their sharp contrast to the Ural-Altaic languages has become evident. In the Dené, or Athabascan, the labors of the Rev. A. J. Morice in the west have supplied excellent material for the important comparisons which should be instituted between the Dené of the northern interior and the dialects of the coast, and the Navaho and Apache of the south. The relationship of the northwest coast tongues has been most fruitfully examined by Dr. Boas, whose conclusions will be laid before this Congress.

Throughout the United States the native tongues have long been systematically studied by the linguists of the Bureau of Ethnology, and many interesting discoveries have resulted. The linguistic map lately issued by the Bureau will long be the guide to laborers in this field. To Mr. Horatio Hale we owe, among many other valuable contributions, the discovery of the extension of the Dakota stock to the eastern seaboard among the Tuteloes, a suggestion followed up by Messrs. Gatschet and Dorsey in the identification of the Biloxis, and probably the Catawbas, as other members of the same family. We still ask further evidence of the identification of the Cherokee with the Iroquois; and the stocks of Texas, Southern Florida and Southern California are not yet positively established.

In Mexico, under the active supervision of Dr. Antonio Penafiel, a mass of material has been collected in the shape of vocabularies by the Ministerio del Fomento; but practically none of this has been

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published. It is very likely that entirely new and unknown linguistic stocks survive in this republic, and it is certain that of many languages and dialects still spoken there we possess only the most meager information. We cannot too strongly urge upon the intelligent scholars of our sister republic to collect and publish the new linguistic material which is at their hands in the less traveled portions of their own country.

The same cannot be said of the Central American, or, as I have called it in my work on "The American Race," the "Inter-Isthmian" region. I do not believe that a single new stock will be discovered between the Isthmus of Tehuantepec and that of Panama; and the only important historic tribe which we cannot assign to its linguistic place is the Guetares of Costa Rica. Dr. C. Sapper, of Guatemala, has, indeed, recently promised me a vocabulary of a new stock from Tapachula, but I shall be surprised if on receipt it does not turn out to be one already familiar.*

Passing to South America, I avail myself of this opportunity to make public for the first time a conclusion which I have reached, opposed not only to the opinion hitherto always expressed by linguists, but to my own former statements. This opinion, so long held, is that the linguistic stocks of South America are more numerous than those of North America. This view I have been obliged to renounce after a prolonged and special study of all the accessible materials concerning South American languages. I am persuaded that the really astonishing multitude of dialects there found will resolve themselves into a comparatively small number of stocks, less, certainly, than those already recognized in the northern continent.†

The interesting question of the possible relationship of some of these stocks with tongues on the northern continent has been noted by Herzog, Uhle, Adam, Ernst, and others, and is eminently deserving of continued investigation. It cannot be said that, up to the present, wholly satisfactory results have been reached.

We have recent and excellent studies of the Carib by Von den Steinen and Adam, of the Southern Brazilian dialects by Ehrenreich,

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*This proved to be the case, as it is found to be a dialect of the Zoque-Mixe family.

†Some evidence may be seen in my *Studies of South American Native Languages.* (Philadelphia, 1892.)

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of the Pano by R. de la Grasserie, who also contributes one on the Puquina to this Congress, on the Kechua, by Middenorff, on the Tupi by Nogueira, Rodrigues and Seybold, on the Chaco dialects by Lafonequevedo, on the Yahcan by Brydges and Hyades; but we have inadequate information of the numerous tongues spoken along the great divide between the basins of the La Plata and Amazon rivers; of those which still survive in the mountains of Southern Colombia and Ecuador, and in Andaqui and the neighboring provinces. We have yet to establish the relationship, if any exists, between the Patagonian Tzoneca, the tongues of Fuegia, and the Great Araucan and Chaco families to the north. Nor can it be allowed that the last word has been said as to the connection of the Aymara with the Kechua, or of the Arawack with the Tupi.

These are hasty references to the geographical lacunæ which are visible on the linguistic map of America; but there are others keenly felt by the student who is in earnest on this subject. He perceives that not only in some localities the material does not exist, but that in others, while it does exist, it remains inaccessible. Here is where we should appeal urgently to governments, learned societies and the intelligent wealthy for aid. We shall never know Nahuatl till the great history written in that language by Father Sahagun, the unique manuscript of which is in the Medicean Library in Florence, is published; we can never learn the full resources of the Maya language until the dictionary written at the Convent of Motul in the middle of the sixteenth century is printed, two manuscripts of which exist—one in my possession. In similar case is the Micmac-English Dictionary of Rand, the Cakchiquel Dictionary of Coto, and many others. How fruitful has been the liberality of Julius Platzmann in republishing extremely rare works on American languages! How valuable the *Library of American Linguistics*, edited by Shea; the *Bibliotheque de Linguistique Americaine*, published under the auspices of various French scholars in Paris; and the similar series brought out by Alphonse Pinart!

I have scarcely left myself room to refer to many scholars who have made general or special studies on American languages, such as Friedrich Mueller, who, in his epochal *Grundriss der Sprachwissenschaft*, offers a systematic analysis of over forty of them; of Lucien Adam, who, besides general studies, has published model monographs on the Chapanec, Mosquito, etc.; of Charencey, whose *Chrestomathie*

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Maya merits the highest commendation; of Dr. Stoll, who has taken as his field the numerous South Maya dialects; of Dr. Sapper, whose recent linguistic map of Guatemala is most satisfactory; or Dr. Darapsky, whose analyses of South American groups are always scholarly; of the Licentiate Belmar, who is exploring the untilled field of South Mexican dialects; of Fernandez Ferraz, to whom we owe valuable publications on Central American native tongues; of Dr. Leon, who has opened the treasures of the Tarascan; of the Abbé Petitot, whose *Dene Dictionary* is the standard; of Rink and Bourquin, whose works on the Eskimo are unsurpassed; and in this list of those who have lent the greatest aid to American linguistics it would be a signal omission to forget the name of James C. Pilling, whose bibliographies of the native languages of North America are unequaled in their class for fullness and accuracy.

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CLASSIFICATION OF THE LANGUAGES OF THE NORTH PACIFIC COAST.

BY FRANZ BOAS.

THE North Pacific Coast is inhabited by a great number of Indian tribes who speak many distinct languages. A comparison of vocabularies of these languages has led to the following grouping in linguistic stocks. In Southern Alaska we find a number of dialects of the Tlingit language. On Queen Charlotte Islands and on a few islands of the Prince of Wales Archipelago the Haida is spoken. In the northern portion of British Columbia, particularly along Naass River and Skeena River, we find the Tsimshian spoken in two dialects. From Northern British Columbia to the central portion of Vancouver Island extend the Kwakiutl, whose language is spoken in three closely allied dialects. Adjoining them at the west coast of Vancouver Island live the Nootka. South and east of these regions a great number of languages are spoken which are all affiliated, and called the Salish languages. An isolated branch of this stock lives among the Kwakiutl, while the great body is located in the interior of British Columbia, Washington, Northern Idaho and Northwestern Montana. A small isolated branch is found south of Columbia River. On the coast of Washington they enclose a small territory on which the Chemakum language is spoken. Along Columbia River they adjoin the Sahaptin and Chinook languages. The Willamette River valley was occupied by people speaking two distinct languages, the Calapooya and the Molala. In this enumeration I have omitted the Athapascan, which is spoken in the northern interior of British Columbia and in a number of isolated regions along the Pacific coast.

In comparing these languages we are, first of all, struck by a certain similarity of phonetics among most of them. We find an abundance of *k* sounds, articulated in all positions from the posterior velar to the anterior palatal position; a series of lateral explosives or *l* sounds articulated at the posterior portion of the palate. On the other hand, the aspirate labials and the lingual *r* are absent. The only languages which show an entirely different phonetic type are the

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Calapooya and Molala. As little is known regarding their structure, I must omit them in the following considerations.

The phonetic system of the various languages may best be set forth by the following scheme:

	Labials.	Point of Tongue.	Back of Tongue.	Thrills. R.	Laterals. L.
Tlingit	—	1	1	1	1
Haida	—*	1	1	1	1
Tsimshian	1	1	1	1	1
Kwakiutl	1	1	1	—	1
Nootka	1	1	1	—	1
Salish	1 †	1	1	—	1
Chemakum	1	1	1	—	1
Chinook	1	1	1	—	1

* M occurs sometimes, but pronounced with semi-closure of the lips.
† Except the Tillamook dialect.

This tabulation shows that the Tlingit, Haida and Tsimshian take a peculiar position among the other dialects, as they have an *r* sound, and as the first two have no labials. The *r* sound in question is a uvular thrill, the lips assuming at the same time the *w* position. As the thrill is very light, particularly in Tlingit and Tsimshian, the sound is often mistaken for *u*. In Bishop Ridley's translation of the Gospel I find, for instance, g'uel for what I hear as g'E'rEl.

In all these languages the difference between surds and sonants is very slight, so much so that I doubt if there is any real difference of this character in Haida and Tlingit. It exists, undoubtedly, in the Kwakiutl and Salish. In the latter language we find the peculiarity that in many dialects *m* and *n* are pronounced with semi-closure of the nose, so that they are difficult to distinguish from *b* and *d*. This peculiarity is also found, although to a less extent, in the Kwakiutl, Nootka, Chemakum and Chinook languages.

When we turn to a consideration of the grammatical form of these languages, we shall find again that Haidi and Tlingit stand decidedly by themselves when compared to the rest of the languages. While all the others use reduplication for grammatical purposes, no trace of reduplication is found in these two languages. A closer comparison reveals a number of other traits which they have in common. There is no trace of grammatic gender and no separate forms for singular and plural or distributive. When it is necessary to state expressly that the plural is meant, a word denoting "a number of " is placed after the noun. Compound nouns are very

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numerous, the compounds being placed side by side without any alteration. Words of two, three and more components which seem to be monosyllabic occur. Local adverbs, which always retain their independence, frequently enter into compound words of this kind. The adjective always follows the noun to which it belongs.

In both languages there are four forms of the personal pronoun. In the independent pronoun the selective and the ordinary form may be distinguished. For instance, in Tlingit, the question: "Who among you is going to go?" requires the answer *xatc*, I; while the question, "Who is there?" requires the answer *xat*, I. The pronoun of transitive verbs differs from that of intransitive verbs, the latter being identical with the objective form of the former. In Tlingit we have *qat* (1) *ɾɛ* (2) *nek* (3) I (1) (am) sick (3), the *ɾɛ* being a particle, but *at* (1) *qa* (2) *saé* (3) it (1) I (2) cook (3); in Haida; *de* (1) *sl'é'ga* (2) I (1) sick (2); but *tla* (1) *ga* (2) *ta* (3), I (1) it (2) eat (3). The latter example elucidates another point of resemblance between the two languages. When transitive verbs have no object, it is necessary to add a general object, in Tlingit *at* (1) *qa* (2) *qa* (3), It (1) I (2) eat (3); in Haida *tla* (1) *ga* (2) *ta* (3), I (1) it (2) eat (3). The transitive verb is formed in both languages by placing the objective pronoun first, next the subject, and last the verb. The objective pronoun is derived in both languages from the objective form of the personal pronoun. The interrogative is formed in Tlingit by the particle *agɛ*, in Haida by *gua*. In the former language the particle follows the verb, in the latter the pronoun. In both languages, however, it follows the adverb, if there is one. The enumeration of similarities shows a far-reaching resemblance of structure of the two languages. I will add a short list of compound words which will make the similarity of structure still clearer.

English.	Tlingit	Literal Translation.	Haida.	Literal Translation.
ankle	*q'os t'aqL*	leg knuckle	*gɣ'aLt'amE'l*	leg knuckle
dancing leggins	*q'os qɛt*	leg dancing apparel	*gɣ'aL gɣa*	leg dancing apparel
lycopodium	*q'oqan si'gɛ*	deer belt	*g'at Ldsga'wa*	deer belt
pipe	*ts'eqda hat*	smoke around box	*xɛ'LEn ga'ɛu da'o*	mouth smoke box
pregnant	*to hat gat'a*	her womb child	*l taL gɣit'ɛ'*	her womb child
roof	*hit ka*	house top	*na u'na*	house top
thief	*ta'o s'a'tɛ*	stealing master	*g'o'Lta Ira'era*	stealing master
warrior	*g'au s'a'tɛ*	fighting master	*ra'HiLa Ira'era*	fighting master

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This similarity of structure becomes the more surprising if we take into consideration that not one of the neighboring languages shows any of the peculiarities enumerated here. The structural resemblance of the two languages and their contrast with the neighboring languages can be explained only by the assumption of a common origin. The number of words which may possibly be connected by etymology is small, and the similarities are doubtful. Nevertheless, the structural resemblance must be considered final proof of a historical connection between the two languages. In concluding, I give a brief list of similar words:

English.	Tlingit.	Haida.
child	*gat*	*gyit*
small	*ga'tsko*	*gE'tso*
ear	*guk*	*gyu*
thumb	*gouc*	*k'usé'*
blood	*cE*	*g.a'i*
knuckle	*f'aqL*	*f'amE'l*
septum	*f'aka'*	*f'a'nri*
sinew	*f'as*	*f'a'tse*
elbow	*f'er*	*tsEgui'*
heart	*tek*	*tek'o'go*
knee	*q'ulo'*	*kyer*
people	*na*	*na* (house)
to stand	*gya*	*gya*
dry	*xoq*	*qa*
woman	*ca'wat*	*dja'at*
on top of	*ki*	*gi*
man	*Lingit*	*e'Linga*
"	*qa*	*q'al*

The next group of languages embraces the Tsimshian, Kwakiutl and Nootka, Salish and Chemakum. As I have proved at another place (*Sixth Report on the Northwestern Tribes of Canada, Proceedings of the British Association for the Advancement of Science, 1890*) that Kwakiutl and Nootka are dialects of the same stock, I do not need to enter on this point here.

All those languages use amplification of the stem for indicating plurality. The plurality may be distributive or frequentative. The amplification of the stem is brought about either by diæresis, by reduplication or by the use of infixes. Time and locality are defined very sharply. In most dialects of these languages presence and absence and past and present are always designated. In other

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respects the languages show great differences. The Tsimshian has certain characters which mark it out decidedly from all the others. While among the southern languages composition is almost always by means of suffixes, the Tsimshian has almost exclusively prefixes. In counting, a few classifying suffixes are found, but we do not observe the occurrence of suffixes or prefixes denoting nouns that are not class-words, such as: parts of the body, house, fire, water. On the other hand, contractions in which parts of words are suppressed apparently for reasons of euphony appear quite frequently, while they are very rare in the southern group of languages, if they exist at all. Therefore, the analysis of Tsimshian words reveals the fact that the principles of composition are quite distinct from those of the Kwakiutl and other southern languages.

The southern group of languages, the Kwakiutl, Salish and Chemakum, which show hardly any indications of relationship, so far as their vocabulary is concerned, have a series of very peculiar traits in common. First among these I mention the occurrence of suffixes denoting nouns; not class-words, but nouns designating concrete, individual objects. Such are primarily parts of the body, furthermore designations of localities, of fire, water, road, blanket, domestic animal (*i. e.*, in olden times, dog) and many others. These words are so peculiar and, moreover, cover in these languages so nearly the same classes of objects, that I cannot help thinking there must be a common source from which they have sprung. We do not find nouns of this character in the Kutonaxa, which adjoins the Salishan languages, nor in the Athapascan, while similar suffixes are found in the Algonquin languages. It is worth remarking that inside the same linguistic stock, namely, the Salishan, their application varies widely. In the dialects of the interior these suffixes are found very frequently, while they are rarer in the coast dialects. Another very important peculiarity which those three languages have in common, and in which they differ from all the neighboring languages, is that whenever an adverb accompanies the verb the former is inflected, while the verb, at least the intransitive verb, remains unaltered. In the Kwakiutl language the object even is inflected while the verb remains unchanged. When a transitive verb is accompanied by an adverb the latter always takes the suffix of the pronominal subject, while the verb takes that of the pronominal object.

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These similarities are so pronounced and so peculiar that they must have originated in a common source.

In judging the differences between the languages of this group, it may be well to dwell briefly on the differences of dialects in two of them, namely, the Salish and the Kwakiutl. The Salish is remarkable for the great number of its dialects and the diversity of forms which they have assumed. These dialects may be grouped in those of the coast, the Lillooet, the Shushwap and the Okanagan. Each of them, except the Shushwap, embraces a number of dialects. The greatest number and greatest diversity are embraced in the coast dialects. All of these have pronominal gender, while the dialects of the interior have no trace of gender. The most northern of this group of dialects, the Bilxula, is remarkable for the extensive elision of vowels. The most southern dialect of the group has lost all the labials, which are frequent in all the other Salishan languages. Most of these dialects also distinguish in the pronoun between presence and absence. The Shushwap dialect is remarkable because it is the only one that has preserved the exclusive and inclusive forms of the first person plural. All the dialects of the interior have many verbs the singular and plural of which is formed from distinct stems. They use suffixes denoting specific nouns much more extensively than the dialects of the coast. They do not distinguish between absence and presence.

The Kwakiutl and Nootka show differences that are still more far-reaching than those between the Salishan dialects. Both localize actions sharply by means of suffixes. The Nootka is satisfied with designating actions as having happened in the house, on the beach, on the water, etc. The Kwakiutl adds always if they took place near the speaker, near the person addressed, absent visible or absent invisible, and also the time, if in the past or in the future. The Kwakiutl has an exclusive and inclusive form of the first person plural which has disappeared in the Nootka. If such differences occur between more closely allied dialects, we do not need to wonder at the greater differences between these languages which show only certain similarities of structure. Each point of similarity gains rather greater weight on account of the divergence of the dialects of each stock among each other.

The differences between the languages may be defined as follows: The Kwakiutl and Nootka have a much sharper localization than any

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of the other languages. They lack entirely pronominal gender. They have an inclusive and exclusive form of the first person plural. Their use of the negation in compounds deserves special mention. Their negation is a prefix which enters into composition.

The Salishan languages have prenominal gender. They distinguish presence and absence, and have inclusive and exclusive forms of the first person plural.

The Chemakum has also pronominal gender. The amplification of the stem for the purpose of forming distribution takes peculiar forms which are not found in the other languages. An apparent infix—*ts*—is the most peculiar of these forms.

I attribute great weight to the occurrence of pronominal gender in both the Chemakum and Salish, as this is a phenomenon of very rare occurrence in America.

Turning further south, we reach a type of language which is entirely distinct from those treated heretofore. This language is the Chinook. It has none of the peculiar nominal suffixes which characterize the preceding group of languages. In fact, its words are of very simple build, local adverbs only entering into the composition of words. Its most important character is the existence of a real gender. The Chinook has a masculine, feminine and neuter, the last-named gender designating, primarily, small objects. So far as I am able to judge, the classification of nouns according to gender does not follow any rules. The vowel of the stem is always in harmony with the vowel of the prefix, so that *e'-ka-la*, male, becomes *o'-ko-la* in the feminine. There exist a surprisingly large number of onomatopoetic terms. Particularly verbs which designate actions accompanied by a noise belong to this class, as: to laugh, to split, to tear, to dig. The language abounds in abstract terms. Many of our adjectives can be expressed only by such terms. Thus the Chinook says, instead of "the bad man," "the man his badness;" instead of "I am sick," "my sickness is on me." We find a singular, dual and plural. They are not formed by amplification of the stem. The first person dual and plural have an exclusive and inclusive form. The verb is incorporating to a degree. It designates by means of prefixes the subject, direct and indirect object. These characteristics distinguish the Chinook sharply from the other languages which we have considered heretofore.

Our review has shown that the seven languages of this region

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which show, so far as we can prove at present, no etymological relationships worth considering, may be classed in four groups:

1. The Tlingit and Haida.
2. Tsimshian.
3. The Kwakiutl, Salish and Chemakum.
4. The Chinook.

The similarities of the languages belonging to each group, on the one hand, and on the other hand the differences between the groups, are so striking, that we must assume that some generic connection exists between the languages of each group. The elucidation of the details of this connection must be left to a closer study of the languages, based upon a comparison of their dialects. So far our knowledge of most of the languages of the Pacific Coast is confined to a meager list of vocabularies. Therefore the classification must be considered in its infancy. Etymologies of Indian languages, the histories of which we do not know, is a subject of the greatest difficulty, and must be based on investigations on the structure of the languages, if it shall not sink to the level of mere guessing. In the present state of linguistic science, a classification ought to take into account structure as well as vocabulary. The former will give us valuable clues where the comparison of mere words ceases to be helpful. It is with the desire to call attention to the importance of this method that the imperfect comparison between the languages of the North Pacific Coast has been presented.

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DIE BEWOHNER DES GRAN CHACO, PARAGUAY.

VON EMIL HASSLER.

EINE weite, immense Ebene, noch wenig bekannt und erst zweimal durchkreuzt, erstreckt sich der Gran Chaco vom 20. Grad bis zum 25. Grad südl. Breite, das rechte Ufer des Paraguay-Stromes bildend bis hin an die Ausläufer der Cordilleren von Bolivien, Salta und Jujuy. Seiner Natur als Alluvialgebiet entsprechend, durchziehen ausser den aus Bolivien kommenden Grenzflüssen Rio Negro im Norden, Pilcomayo im Westen und Süden nur spärliche unbedeutende Wasserläufe das mit übermannshohem Steppengras bedeckte Gebiet. Wo die leicht gewellte Oberfläche etwas ansteigt, unterbrechen hohe, dichte, theilweise undurchdringliche Wälder die Monotonie der mit Palmen dicht besäeten Prairie. Rudel von Hirschen, Wildschweinen und Straussen (*Rhea Americana*) beleben die so eigenartige Landschaft. Am Ufer der Flüsse, Bäche und der vielen kleinen Lagunen sonnen sich unzählige Alligatoren, von Tausenden von Sumpf- und Wasservögeln umgeben, die sich nicht im Geringsten durch die Gegenwart des beutegierigen Reptils am Futtersuchen einschüchtern lassen. Bei Mondschein sind diese selben Stellen dann der Rendezvousplatz der mit Behagen sich im Schlamme wälzenden Tapire und der grössten aller Nager, der Capyrara. Nicht selten aber werden diese letzteren in ihrem nächtlichen Vergnügen gestört durch einen im hohen Grase lautlos heranschleichenden Jaguar, der, mit sicherem Sprunge eines der armen Opfer erhaschend, dasselbe seiner Lagerstätte zuschleppt, um je nach der Grösse derselben oft tagelang davon zu leben. Dies in wenigen Worten das Gebiet, das heute noch von allerdings nur spärlichen Ueberresten eines Volkes, das ich unter dem generischen Namen Chaco-Indianer zusammenfasse, bewohnt wird.

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Mit Ausnahme der die nördliche Grenze des Gran Chaco bewohnenden Chamacoccos, die in wilde und zahme eingetheilt werden, deren Stammesverwandte hauptsächlich in Bolivien zu finden sind, und der die Südgrenze und die angrenzenden argentinischen Gebiete bewohnenden Tobas, als deren Opfer im Jahre 1882 der berühmte Amerikaforscher Dr. Crevaux fiel, können wir alle übrigen den Chaco bewohnenden Stämme als zu einer grossen Völkerfamilie gehörig zusammenfassen. Trotzdem jeder der fünf Stämme seine eigene Sprache, seine eigenen Sitten und Gebräuche hat, müssen wir sie doch ethnographisch als eins auffassen.

SPRACHE.

Die Sprachdifferenz ist mehr Dialektdifferenz, da die hauptsächlichsten Worte alle von einem einzigen Sprachstamme herstammen, über den wir noch nicht viel wissen. Es ist mir während mehrjähriger Reisen möglich geworden, nur spärliche Vokabularien, die nach meiner Ansicht noch sehr viele Irrthümer enthalten, zusammenzustellen. Die Schwierigkeit ist nämlich eine doppelte: Die wenigen Individuen, welche ausser ihrer eigenen Sprache noch eine andere verstehen, kennen nur ein sehr unvollkommenes Guarani, das sie im Verkehr mit der paraguayschen Landbevölkerung des linken Ufers erlernt haben. Spanische Worte sind denselben ganz unbekannt.

Die fünf Hauptstämme sind die folgenden, nach ihren Wohnplätzen aufgezählt von Norden nach Süden:

Guanás.
Sanapanás.
Cuximanopanás.
Angaytés.
Lenguas.

Die ersten drei lassen sich zusammenfassen zu einer einzigen Gruppe, die ich mit dem Namen Guaná-Gruppe bezeichne. Sowohl in ihren Sitten als auch ihrer Sprache sind nur geringe Unterschiede vorhanden. Ich werde, um den Rahmen eines Vortrages nicht zu überschreiten, bei der Spezialbeschreibung der einzelnen Stämme nur auf die Guanás, als den typischsten der drei, näher eingehen.

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DIE GUANÁS.

Die Guanás bewohnen den Uferstrich des Paraguay-Flusses zwischen dem Rio Negro und dem als Fecho dos Morros bekannten Vereinigungspunkt des Rio Paraguay. Im Norden des von den Guaná bewohnten Gebietes wohnen die Chamacoccos, ihre gefürchteten Feinde, im Osten, d. h. ca. 20 Meilen von dem Ufer des Paraguay entfernt, die stammverwandten Cuximanopanás, und im Süden die ebenfalls befreundeten Sanapanás, deren Gebiet sich bis zum Rio Galvan, gegenüber dem Grenzflusse Apa, erstreckt.

Ihre Nachbarn und Gegner auf dem linken brasilianischen Ufer des Paraguay-Flusses sind die Cadocos-Stämme.

Die Guanás bestehen aus 9 verschiedenen Stämmen von zusammen vielleicht 250 Seelen. Jeder dieser Stämme hat sein streng abgegrenztes Wohn- und Jagdgebiet, das vielleicht durchschnittlich 40 bis 60 Quadratmeilen gross ist. Festen Wohnsitz hat keiner der Stämme. Je nach der Jahreszeit, d. h. der Jagdsaison, beziehen sie entweder direct am Flussufer oder auch weiter im Innern gelegene Lager. Die Hütten sind auch dieser nomadischen Lebensweise entsprechend gebaut. Vier durch Querstangen verbundene Holzpflöcke von ca. 1¾ Meter Höhe werden je etwa 2½ Meter von einander entfernt in den Boden festgerannt, mit Hülfe von Lianen und Bromeliafaserschnüren werden Schilf und breitblättrige Philodendron als Dach darüber befestigt, und die Sommerwohnung ist fertig. Vier bis sechs Hängematten auf diesem kleinen Raume über- und nebeneinander aufgespannt, auf dem Boden ein qualmendes, nur glimmend erhaltenes Feuer, mit Harz von einer Guyacaart gespeist, vervollkommnen die Einrichtung des luxuriösen Palastes. Bei starkem Regen gewähren einige an den Seitenwänden aufgehängte Binsenmatten nothdürftigen Schutz gegen seitlich eindringende Regentropfen. Ein solcher luftiger Bau beherbergt oft 8—10 Menschen. Im Winter werden mit Rinden und gespaltenen Palmen an den Seiten geschützte und mit doppeltem Schilfdach versehene Wohnungen gebaut, eine dicht an der andern; selten hat aber ein solcher Toldo mehr als sechs Hütten, da die Toldos sich gewöhnlich aus höchstens 25—30 Individuen zusammensetzen. Die Winterwohnung ist sorgfältiger gebaut. Das Dach fällt nach zwei Sei-

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ten ab. Die Kochstelle befindet sich im Innern. Für Rauchabzug ist nur die mit einer Binsenmatte verhängte Thür vorhanden. Der oberste Befehlshaber eines jeden Toldos ist der Cacique. Die neun verschiedenen Caciques stehen aber alle unter dem Cacique-Guazú, der in dem jagdreichsten Gebiete seinen Wohnsitz hat. Rangunterschiede bestehen keine, nur hat der Cacique als Anführer bei allen Unternehmungen, sei es Jagd oder Fischfang, zu dienen. Der jeweilige Cacique wird vom Cacique-Guazú ernannt, d. h. er erwählt den Tapfersten eines Toldo, und derselbe bleibt lebenslänglich in Funktion. Die Würde des Cacique-Guazú, d. h. des Oberhäuptlings des ganzen Guaná-Stammes, ist erblich und geht vom Vater auf den erstgebornen Sohn über. Der Cacique-Guazú ist der oberste Führer im Kriegsfalle, er ist auch der Schiedsrichter zwischen den einzelnen Toldos, und alle fügen sich willig seiner Entscheidung. Es kommt nämlich nicht selten vor, dass ein Toldo im Jagdeifer seine Jagd auf das Gebiet eines andern Toldos ausdehnt; kommt dies vor, so beklagt sich der Toldo, dessen Gebiet verletzt wurde, und die Entscheidung lautet gewöhnlich, dass die Jagdbeute, ein Hirsch oder Alligator, den rechtmässigen Eigenthümern zurückgegeben werden muss.

JAGD.

Der Guaná verbringt den grössten Theil des Tages mit Jagen oder Fischen, um für sich und die Seinen den nöthigen Lebensunterhalt zusammenzubringen, während dessen die Frauen und Kinder mit Anfertigung von Waffen, Töpfereien und den allerdings gewöhnlich blos aus Federn bestehenden Kleidungsstücken beschäftigt sind.

Die beliebteste Jagd, weil sie die ausgiebigste Beute liefert, ist die Hirschjagd. Der Guaná ist ein guter Schütze, und mit seinem aus Palo de lanza gemachten Bogen weiss er sehr geschickt umzugehen. Im Gegensatz zu den brasilianischen Stämmen zielt er direkt, und die aus Eisenholz gefertigte mit Widerhaken versehene Spitze des Pfeiles dringt oft durch und durch. Sehr oft aber auch kommen die Männer ohne Beute von der Jagd zurück, und Waldfrüchte und Samen bilden an dem betreffenden Tage, wenn nicht vielleicht die Jungen mit ihren aus Knochen gefertigten Angeln einige

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Fische erlegt, die einzige Nahrung. Das kommt öfters vor, und daher ist denn auch begreiflich, dass, wenn die Jagd gelungen, eine unmässige Fresserei stattfindet. Bis der ganze Hirsch aufgezehrt, ruht der Toldo nicht. Von Aufbewahren für einen Tag, an dem das Jagdglück weniger günstig, kennen die Leute nichts. Essen bis alles verschwunden ist, ist die Losung. Die Zubereitung ist sehr einfach: Entweder wird das Fleisch am Spiesse gebraten oder mit einigen essbaren Wurzeln zusammen in einem irdenen Topfe gekocht, ohne Salz, das, obwohl es in der dortigen Gegend in einigen Lehmstellen sich findet, den Leuten doch unbekannt ist. Die übrigen beliebten Jagdthiere sind das Carpincho (*Hydrachœrus Capyharati*), das Wildschwein und das Pekari, und *last not least* der moschus-riechende Alligator, eine beliebte Delikatesse. Die Vögel werden nur ihrer bunten Federn wegen, die als Schmuck dienen, gejagt, und Papageien zu Zähmungszwecken mit stumpfen, vorne mit Holzkolben versehenen Pfeilen betäubt. Die Fische, die auch eines der beliebten Nahrungsmittel bilden, werden mittelst Angeln, von spitzen Knochen gemacht, oder mittelst eines eigenartigen Reusenapparates gefangen.

Grosse Freunde des Bienenhonigs sind die Guanás ebenfalls. Mittels einer speciell konstruirten einer Tabakspfeife ähnlichen Röhre, die sie mit Blättern einer Datura-Art füllen und deren Rauch dann durch eine kleine Oeffnung in den hohlen Stamm, in dem die Bienen hausen, eingeblasen wird, betäuben sie die kleinen, emsigen Honigfabrikanten, und vermittelst eines pinselartigen Instrumentes, das in die Höhlung eingetaucht wird und nach dem Herausnehmen in ein Kürbisgefäss ausgepresst, entleeren sie die ganze Höhlung ihres süssen Inhalts. Der Honig wird sowohl als solcher als auch mit Wasser vermengt und einer leichten Gährung unterworfen, genossen.

KRIEG.

Krieg führen die Guanás nur selten, d. h. wenn sie von ihren gefürchteten Feinden, den Chamacoccos, angefallen werden, so setzen sie sich tapfer zur Wehr, müssen aber gewöhnlich der Uebermacht erliegen und einige der Ihrigen bleiben dann gewöhnlich als Opfer des Kampfes auf der

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Wahlstatt. The Chamacoccos verwüsten dann das Lager, schleppen eventuell vorhandene Gegenstände mit sich und ziehen sich in ihr Gebiet zurück. In der letzten Zeit kommen jedoch diese Kämpfe immer seltener vor, da die Stämme immer schwächer werden und wohl bald gänzlich verschwinden werden.

EHE.

Wenn ein junger Guaná das mannbare Alter erreicht, d. h. mit ca. 14 Jahren, muss er, bevor er sich eine Gefährtin zulegen darf, Proben seiner Mannbarkeit ablegen, die in dem Erlegen eines Jaguars bestehen. Ist ihm dies, was nicht immer so glatt von statten geht, gelungen, so sieht er sich unter den mannbaren Töchtern des Stammes um, sei es im eigenen oder einem Nachbartoldo, und legt dann der Auserwählten die erlegte Tagesbeute nachts vor die Hütte. Ist dieselbe am andern Morgen verschwunden, ist dies der Beweis, dass der Freier willkommen, d. h. dass die Angebetete ihm als Frau angehören will. Fälle von Zurückweisung scheinen nicht vorzukommen, denn die Regeln sind sehr strenge eingehalten, dass ein Mädchen sofort nach Eintritt der Menstruation, d. h. zwischen zwölf und dreizehn Jahren sich verheirathen muss, und da gewöhnlich Mangel an Mädchen in Verhältniss zu den Männern ist, weil männliche Nachkommen sorgfältiger gepflegt werden als weibliche, and daher mehr weibliche Kinder sterben.

Die Braut muss den ganzen der Hochzeitsnacht vorangehenden Tag fasten, dann wird sie bei einbrechender Dunkelheit von ihren Angehörigen nach dem Festplatze geleitet und bringt nun die ganze Nacht, ohne Nahrung oder auch nur Wasser zu nehmen, in der Mitte der einen Kreis um sie bildenden Toldogenossen zu. Die Frauen lassen in regelmässigen Intervallen langgezogene Schreie ertönen, die durch die Männer mit kurzen Schreien unterbrochen werden. Unterdessen circulirt under den Anwesenden fleissig der Methenthaltende Kürbiskrug. Wenn die ersten Sonnenstrahlen den nahenden Tag ankündigen, entführt dann der Bräutigam die Braut aus dem Kreise und verschwindet mit ihr im nahen Waldesdunkel. Hier möchte ich die für den Anthropologen sowohl als Physiologen interessante Bemerkung ein-

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schieben: Coitus a parte postica efficitur, sed nunquam domu noctuque, semper die et in silva.

Es ist kein beneidenswerthes Loos das ihrer wartet, denn die Stellung der Frau ist eine sehr untergeordnete. Sie ist weiter nichts als das Packthier, und alle Arbeiten, Häuser bauen, Waffen anfertigen, Töpfereien, Kleider, Hängematten fabriziren, Brennholz und Wasser herbeizuschleppen, etc., alles das ist der Frauen Loos.

GEBURT.

Fühlt eine Frau dass die Stunde ihrer Entbindung naht, so begiebt sie sich in Begleitung einer weiblichen Anverwandten oder Freundin nach dem benachbarten Wald, ein kleines biegsames Bäumchen wird als Entbindungsstelle ausgewählt, alle darum herumliegenden Laubblätter und Zweigstücke entfernt, der Erdboden mit Asche bestreut, und nun erfasst die Wöchnerin das herabgebogene Bäumchen mit beiden Händen und erwartet in kauernder Stellung die Entbindung, die gewöhnlich rasch und leicht verläuft, die Freundin oder Verwandtin empfängt mit ihren Händen den neuen Erdenbürger, mit Bastfasern wird ungefähr zwanzig Centimeter vom Nabel der Nabelstrang unterbunden und mittelst eines geschärften Knochens durchschnitten und die Schnittstelle mit Copaivabalsam eingerieben. Mutter und Kind unterziehen sich in einem nahe gelegenen Wasser der nöthigen Ablutionen, während die Verwandte die Placenta sorgfältig in Blätter einhüllt, mit Bast verbindet und mit nach Hause nimmt. In der Hütte angekommen, wird dem Vater die so verpackte Placenta übergeben. Derselbe befestigt sie mit eigener Hand auf dem Dache des Hauses, wenn das Kind ein Knabe ist; wenn ein Mädchen, wird sie vergraben. Die Wöchnerin verrichtet vom ersten Moment an wieder alle gewohnten Arbeiten im Hause, darf dasselbe aber während der 40 Tage die die Locchien dauern, nicht verlassen, ebenso wie sie sich während der ganzen Zeit streng nur an vegetabilische Nahrung hält. Dem Herrn Gemahl ist es ebenso streng verboten während der ersten 8 Tage etwas anderes als Vegetabilien zu geniessen, und ebenso muss er sich hüten die Füsse nass zu

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machen, dies könnte sonst nach Ansicht der Leute den Tod des Sprösslings herbeiführen.

AERZTE.

Eine eigenthümliche Einrichtung haben die Guanás, welche die übrigen Chacostämme nicht kennen. Es sind dies die Medizinmänner. Die Eigenschaft Medizinmann zu sein ist erblich und geht vom Vater auf den Sohn über. Eine eigenartige Ceremonie führt den Neophyten in die Geheimnisse der Kunst ein und verleiht ihm die angebliche Kraft zu heilen. Ein eigenes Haus wird gebaut für den jungen Arzt, in jeder Ecke desselben wird ein Gefäss aufgestellt, dass je nachdem es die Süd- Nord- Ost- oder Westecke ist, bestimmte Pflanzen und Wurzeln aufzunehmen hat. Dieselben werden mit Wasser vermengt einer Art Gährung überlassen, und während dieser Zeit darf Niemand ausser dem Arzt-Vater die Hütte betreten. Am fünften Tage betritt nun der junge Medizinmann, von seinen Verwandten begleitet und vom Vater geführt, zum ersten Male sein zukünftiges Heim. Unter den mark- und ohrenerschütternden Gehäul der Weiber wird nun in der Mitte des Hauses ein neues noch nie gebrauchtes Thongefäss aufgestellt, das aus in einer Mondscheinnacht gegrabenen Thon verfertigt ist, auf einem Palo santo Feuer gebrannt und mit einer Euphorbiaceen Asche bemalt ist. Mit dem östlichen Gefäss anfangend, leert nun der Vater Medizinmann die ekelerregenden Flüssigkeiten eine nach der andern in das Mittelgefäss und zerschlägt dann jedes der vier in den Ecken befindlichen Gefässe. Nun ergreift der Candidat das Höllengebräu und verschluckt es standhaft auf einmal. Der Vater ergreift das Gefäss nachdem es geleert und zerschlägt es am eisernen Schädel des durch die Ceremonie in den Kreis der Medizinmänner aufgenommenen Sohnes. Aber noch ist nicht alles zu Ende, denn drei Tage muss der Candidat noch im neuen Hause unter strengem Fasten zubringen. Sehen wir nun zu wie der Medizinmann seine Curen vornimmt. Das erste was geschehen muss, um der Cur Erfolg zu vershaffen, ist dem Medizinmann, sobald er zum Kranken kommt, alles das zu schenken, was er sich wünscht. Dann beginnt er die Cur, indem er alle Anwesenden zur Hütte hinausschickt, fängt an zu singen und eifrig

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die leidende Stelle zu bespeien. Der Glaube ist nämlich dass die Heilkraft durch das Zaubergetränk in seinen Körper übergegangen ist, und dann durch Sekretion, d. h. durch den Speichel dieselbe auf den Kranken übergeht. Ausserdem wird der Kranke fleissig gewaschen. Der Arzt oder die Aerzte saugen an der verwundeten Stelle oder an der Stelle der Schmerzen. Von Wundbehandlung haben die Leute keine Idee, ebensowenig wie von Blutstillung. So kommt es dass man häufig Fälle von Gangräne von oft unbedeutenden Wunden herrührend sieht. Der Speichel muss für alles gut sein. Eine eigene Art von Medizinmännern sind die Schlangendoktoren. Auch hier ist der Beruf erblich. Der einzuführende macht ungefähr dieselben Ceremonien durch, nur statt des berüchtigten Gebräus muss er eine Klapperschlange zuerst aussaugen, und nachher das ganze in Streifen zerschnittene Fleisch des Rückens roh verspeisen. Die Behandlung des von Schlangen Gebissenen besteht, erstens im Aussaugen der gebissenen Stelle durch den Medizinmann, nachher ebenfalls Anspeien der verwundeten und empfindlichen Region und Saugen des Bauchnabels bis Blutstropfen hervortreten.

Eine eigenthümliche Tradition sei hier erwähnt. Nach derselben dürfen keine Frauen während der Dauer der Menstruation Honig geniessen, da sie sonst sofort in einen Tiger verwandelt würden.

Die hauptsächlichen Todesursachen sind Magen- und Eingeweideerkrankungen, von Zeit zu Zeit Pockenepidemien und vernachlässigte Verwundungen; oder Tod durch Unfall auf der Jagd oder im Krieg.

Immer mehr nimmt die Zahl der Guanás ab, der Nachwuchs ist nicht im Verhältniss zur Sterblichkeit, in den letzten Jahren hat auch durch Händler, Missionare etc., das Feuerwasser seinen Einzug gehalten, und wenige Jahre noch und die Chacostämme der Guanás, Coximonopanás, Sanapanás, etc., werden nur noch in den ethnographischen und anthropologischen Museen fortleben, wo noch einige Ueberbleibsel des einst so zahlreichen und interessanten Volkes existiren.

TOD.

Liegt ein Guaná im Sterben so wird er von allen den Seinen verlassen und nur der Medizinmann bleibt bei ihm

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bis alles vorüber ist. Er wird dann an eine entlegene Stelle in der bekannten kauernden Stellung ca. 1 meter tief begraben, und alle ihm gehörigen Gegenstände auf das Grab gelegt, ebenso wie seine Hausthiere, d. h. Papageien, Affen, etc., die getödtet oben auf das Grab gelegt werden.

ANGAYTÉS.

Die Angaytés bewohnen den Gran Chaco von den Villa de San Salvador gegenüberliegenden Hügeln bis zum Riacho Galvan. Ihre Nachbarn sind gegen Süden die Lenguas, und oberhalb des Apa die Sanapanás.

Sie sind ein kräftiger, wohlgebauter Volksstamm, der sein Leben von der Jagd und dem Fischreichthum des Flusses Paraguay fristet. In einem von der Natur etwas stiefmütterlich behandelten Gebiete wohnend, hat dies ohne Zweifel auch ihre Gemüthsart beeinflusst, indem sie scheu und furchtsam sind. Die Bedeutung ihres Stammesnamens, Angayté (Arme), den sie sich selber beilegen, giebt schon davon Zeugniss. Längs der Küste des Paraguays existiren fünf Toldos oder Dörfer, von denen jedes unter einem Cacique oder Häuptling steht. Alle diese fünf Dörfer stehen unter einander in fortwährender Verbindung; zu Lande oder zu Wasser vermitteln sie sich durch Boten alle wichtigen Neuigkeiten, und bei allfälligen Kriegszügen oder sonstigen schwierigen Unternehmungen gehen sie, obschon durch weite Distanzen von einander getrennt, vereint vor. Die verschiedenen Toldos sind auch ausser der Stammesverwandtschaft durch Blutsverwandtschaft mit einander verbunden; so sind z. B. zwei der gegenwärtigen Caciques Brüder, die Frau des einen Cacique Tochter eines dritten Häuptlings. Der ganze Stamm, d. h. alle fünf Toldos zusammen, zählt ca. 130 Seelen. Das Zerstreutwohnen auf einem grossen Gebiete beruht nur auf der Nothwendigkeit. Der ganze von ihnen bewohnte Theil des Gran Chaco liegt im sogenannten Ueberschwemmungsgebiet des Paraguayflusses, daher sind die Angaytés während etwa sechs bis acht Monaten des Jahres auf sehr kleine, etwas über dem hohen Wasserstand des Flusses gelegene Landstriche angewiesen, um sich ihre Lebensbedürfnisse zu verschaffen, und da diese Gebiete nir-

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gends gross genug sind, um den ganzen Stamm zu nähren, so ist auch die Zersplitterung desselben erklärlich.

Die mit dem pompösen Namen Toldo oder Dorf benannte Wohnstätte der verschiedenen Angayté-Horden besteht aus einer einzigen, circa 12 Meter langen, vier Meter breiten und in der Mitte drei Meter hohen Hütte, die als gemeinschaftlicher Aufenthaltsort für Jung und Alt dient. Das Skelet derselben besteht aus sechs aufrechtstehenden, schwarzen Palmstämmen, die von der dort im Ueberfluss vorkommenden *Palma negra* (Copernicia) gewonnen werden. Von diesen Stämmen sind vier an den vier Enden der Hütte vertical angebracht; diese messen ungefähr 1½ Meter, und zwischen diesen stehen zwei, circa 3 Meter hohe Stämme, die dann die First, gewöhnlich aus einer einzigen, ca. 12 Meter langen Palme bestehend, tragen. Einige gespaltene Palmen dienen dazu, die First mit den übrigen beiden Längsbalken zu verbinden. Das Ganze wird mit Stroh und Schilf gedeckt und bietet so einen nothdürftigen Schutz gegen Wind und Regen. In der Mitte dieser Hütte befindet sich die Feuerstätte, auf welcher stets ein kleines Feuer unterhalten wird, das infolge der daraufgelegten grünen Pflanzentheile das Innere stets mit einem beissenden Rauch erfüllt, der den Zweck hat, den Insassen einigen Schutz gegen die zahlreichen Moskitos zu gewähren. Trotz dieser so anti-hygienischen Atmosphäre sind Schleimhauterkrankungen der Augen, der Nase oder des Kehlkopfs unbekannt unter den Bewohnern dieser Brutstätten von Ungeziefer und Parasiten.

Die Bewegung im Innern des Toldos ist nur auf allen Vieren möglich, da der ganze Raum in der Höhe von circa einem Meter über dem Boden mit Hängematten überspannt ist, in denen den Tag über die nicht mit Jagd oder Krieg beschäftigten Männer ausruhen, sich von den Frauen bedienen lassend. Nachts werden die Hängematten von Jung und Alt als Schlafstätte benutzt.

Die Verfassung der einzelnen Horden ist eine patriarchalisch-absolute. Der Cacique, dessen Würde als Erbe auf den ältesten Sohn übergeht, ist derjenige, der die andern im Kriege anführt, über die Geschicke jedes einzelnen Stammesgenossen entscheidet, aber mehr als Vater, dem Alle unbedingten Gehorsam leisten, denn als Herrscher; ihm gehört

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nach der Jagd das beste Stück, er hat den besten Schlafplatz. Aeusserlich zeichnet er sich vor seinen Stammesgenossen nur durch einige ihm allein zukommende Zierrathen aus, wie z. B. durch einen Kopfschmuck, der grössere Federn hat, etc.

Im Kriegsfalle vereinigen sich die verschiedenen Horden, um gemeinschaftlich vorzugehen. Den Oberbefehl führt jeweilen derjenige Cacique, an dessen Gebiet der Kriegsschauplatz angrenzt. Die Kriege sind in letzter Zeit selten geworden und bestehen höchstens aus einem Raubzug in's Gebiet eines der Nachbarstämme, von dem sie gewöhnlich ausgehungert und ermattet zurückkommen, ohne etwas anderes ausgerichtet zu haben, als vielleicht einen der bei ihrem Ausrücken von seinen Bewohnern verlassenen Toldo in Brand gesteckt zu haben. Die Angaytés werden nämlich von ihren Nachbarstämmen, die zwar viel tapferer sind, sehr gefürchtet, da sie aus der Zeit der Lopes'schen Kriege her einige alte Flinten besitzen, die ihnen aber aus Mangel an Pulver und Blei zu nichts nützen.

Die Angaytés sind Monogamisten. Die Knaben verheirathen sich sofort nach Eintritt der Pubertät, d. h. mit circa zwölf bis dreizehn Jahren. Der manngewordene Knabe sieht sich dann unter den heirathsfähigen Töchtern des Stammes um. Zu diesem Behufe unternimmt er eine eigentliche Brautschaureise zu den verschiedenen Horden. Kriegerisch geschmückt, das Antlitz mit einem aus Urucu- (*Bixa orellana*) Samen gefertigten rothen Farbstoffe gänzlich bemalt, besucht er die verschiedenen Toldos. Hat er sich dann eine der holden Schönheiten ausgewählt, erbittet er sie von dem Caciquen, zu dessen Horde sie gehört, als Frau, was ihm denn auch immer gewährt wird. Abends findet die Trauung in Form einer allgemeinen Völlerei und Betrunkenheit aller Toldogenossen statt, und vom nächsten Morgen an beginnt die Gattin ihre Obliegenheiten als solche, d. h. nach indianischen Begriffen, sie ist die Magd und Sklavin ihres Ehegemahls.

Alle Arbeiten, mit Ausnahme des Krieges und der Jagd, werden von den Frauen ausgeführt; bei grossen Märschen sind sie es, die alles Nöthige mitschleppen. Mit Sack und Pack und Kindern beladen, folgen sie willig den nur Bogen

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und Pfeil tragenden Männern, sich glücklich fühlend, wenn nach Abspeisung derselben noch etwas für sie und die Kinder übrig bleibt. Im Gegensatz zu vielen andern Stämmen sind diese Frauen glücklich, da ihr Gemahl, so lange sie leben, keine andere nimmt und ihrer also nicht das Loos der Verstossung, wie so vielen andern, wartet.

Die Geburt vollzieht sich, wie bei den meisten Naturvölkern, ausserordentlich schnell und ohne fremde Beihülfe. Der Nabel wird von der Wöchnerin selbst mit einigen Bastfasern unterbunden und dann zwischen zwei Steinen abgequetscht. Mutter und Kind unterwerfen sich dann sofort nachher einem Reinigungsbade in dem am nächsten liegenden Bach oder Flusse. Sofort darauf nimmt die Wöchnerin ihre gewohnten schweren Hausgeschäfte wieder auf, als ob nichts weiter geschehen wäre. Die Kinder werden bis zum Ende des zweiten Jahres gesäugt. Der Durchbruch der Zähne erfolgt gewöhnlich nach Ende des ersten Jahres.

Von Krankheiten, die sich häufig unter ihnen zeigen, erwähne ich Magen- und Eingeweide-Erkrankungen und zeitweise Blatternepidemien. Wenn ein Kranker dem Tode nahe ist, so wird er von seiner ganzen Familie verlassen, und diese kehrt erst dann wieder, wenn er gestorben. Dann wird der Leichnam ohne Schmuck und Ceremonien in aufrecht kauernder Stellung in ein unweit gelegenes Grab versenkt und seiner nur insofern gedacht, dass im Falle es ein Mann war, seine Frau das Haar kurz scheeren lässt und sich nicht wieder verheirathen kann, bevor dasselbe nachgewachsen.

LENGUAS.

Die Lenguas bewohnen das Gebiet das den Hügeln von San Salvador gegenüber sich erstreckt bis zum Rio Confusio, der einige Meilen oberhalb der Hauptstadt Asuncion sich in den Rio Paraguay ergiesst. Im Osten bildet der Paraguayfluss und im Westen das Sumpfgebiet des Pilcomayo die Grenzen. Ihre Nachbarn im Norden sind die vorher beschriebenen Angaytés, im Westen und Süden die wilden Tobas und im Osten das mit verschiedenen grösseren Ortschaften besetzte linke Ufer des Paraguayflusses. Die Lenguas sind also der durch seine Lage mit den bewohnten und civilisirten Theilen von Paraguay am meisten in Ver-

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bindung stehende Stamm der grossen Chaco Familie. Der Verkehr mit den auf dem gegenüber liegenden Paraguay Ufer wohnenden Paraguayern, die Anlegung verschiedener Estancias in dem von ihnen bewohnten Gebiete haben sie mehr mit der Civilisation in Verbindung gebracht als die übrigen Stämme, und sie sind desshalb eigentlich für den Ethnographen das uninteressanteste Volk der drei Stämme. Ich habe aber vor Jahren noch Gelegenheit gehabt dieselben kennen zu lernen, bevor sie ihre vielen Eigenschaften verloren, und wenn ich Ihnen daher eine Schilderung des Lebens der Lenguas vortrage, so ist es nicht der Lengua von heute, sondern der Lengua wie er allerdings vor wenigen Jahren noch war. Wer heute die abenteuerlich mit allen möglichen und unmöglichen Kleidungsstücken europäischer Macherschaft, mit Pelzmantel und bunte Hosen und Cylinderhut by 100 Grad Temperatur, oder in dünnen Mousselinröcken aus irgend einer Theatergarderobe stammend, oder mit einer leeren Conservenschachtel, Sardinenbüchse, etc., behangenen Gestalten sieht, die betrunken und gebrochen sich bettelnd in den Ansiedelungen herumstreichen, und sie mit den stattlichen halbnakten aber kräftigen, intelligent dreinschauenden Gestalten von früher vergleicht, dem befällt ein Gefühl des Wehmuths und ein Bedauern, dass die sogenannte Civilisation immer mehr fortschreitet. Schritt für Schritt geht sie vorwärts, und mit ihr im Gefolge das Feuerwasser, ein originelles Volk nach dem andern wird ihr zur Beute, und bald wird Amerika seiner letzten Ureinwohner ledig sein. Zuerst der Missionär, und ihm auf dem Fusse folgt der Schnapshändler; manchmal—und ich muss gestehen ich habe es gerade unter den protestantischen gesehen—vereinigen sie beides in einer Person. Doch ich verliere mich auf Bahnen die eigentlich nicht in den Rahmen des Vortrags hineingehören.

Woher die Lenguas eigentlich den in ganz Paraguay gebräuchlichen Namen haben, der „Zungen" bedeutet, ist mir bis heute ein unaufgeklärtes Räthsel geblieben. In ihrer eigenen Sprache nennen sie sich Coitychi, d. h. durchbohrte Ohren bedeutet. Die Lenguas tragen nämlich alle einen bis 5 cm. dicken runden Klotz, aus dem leichten Holze der *Erythrina Cristagalli* (Cibo) geschnitzt, in den von Jugend auf

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systematisch erweiterten Ohrlappen. Sofort nach der Geburt werden einem jeden männlichen Wesen die beiden Ohrläppchen mittelst eines spitzigen Knochens durchbohrt, diese Löcher mit der Zeit durch konische Holzpflöcke immer mehr erweitert, bis sie beim ausgewachsenen Mann einen stattlichen Klotz von 4-5 cm. Durchmesser aufnehmen können. Gegenüber der paraguayschen Stadt Concepcion, ca. 40 km. vom Ufer des Paraguayflusses entfernt, befindet sich der Stammsitz der Lenguas, d. h. ihr ständiges Hauptlager. Sie bezeichnen es mit dem Namen Toldo Guazú, d. h. grosses Dorf. Auf einer hügeligen Erhöhung des sonst so flachen Chacogebietes am Ufer eines kleinen Baches gelegen, bildet es mit dem im Hintergrund befindlichen von stattlichen Onebracho und Palo de lanza strotzenden Bäumen ein eigenartiges, interessantes Gemälde. Der Toldo Guazú besteht aus 12-15 mit ausgehöhlten gespaltenen Palmen bedeckten, ca. 6 m. langen und 4 m. breiten Hütten. Die aus kräftigen Stämmen bestehenden Pfosten sind durch ein Flechtwerk aus Bambus und Binsen mit einander verbunden. Im Winter wird dieses Flechtwerk überdies noch mit enthaarten Hirschfellen, die zu grossen Decken zusammengenäht sind, dicht gemacht, um die Insassen gegen die dort schon empfindliche Kälte, ca. 5-8° Celsius über Null, zu schützen. Ca. zwei drittel der Hütte werden durch eine ½-1 Meter vom Erdboden sich erhebende, mit Palmen als Unterlage und mit Binsenmatten und Hirschfellen bedeckte Pritsche eingenommen, die den Schlafplatz der ganzen Familie bildet, oder, besser gesagt, der ganzen Horde, denn eine jede dieser Wohnhütten birgt ca. 20 bis 25 Einwohner. Der übrige Platz ist der Feuerstelle eingeräumt, dem grossen Wassergefässe und den Vorräthen. Unter der Pritsche sind die Waffen, Häute, Vorräthe etc., untergebracht. An den Dachsparren hängen die aus Yucca und Bromeliafasern zierlich gearbeiteten Säcke zu Dutzenden, die Reichthümer eines jeden Einzelnen einschliessend, als da sind Schmuckgegenstände, Farben zum Bemalen etc.

Der Stamm besteht aus 12-15 Horden, die alle unter dem Cacique guazú stehen. Der Cacique guazú hat seinen ständigen Wohnsitz im Toldo guazú, während die einzelnen Horden je nach der Jahreszeit unter der Anführung ihres

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selbstgewählten Hordenführers sich entweder am Ufer des Paraguayflusses aufhalten oder noch weiter in das Innere ziehen. Die Würde des Cacique guazú ist erblich, und geht vom Vater auf den Sohn über. Ist kein Sohn da so wird der Bruder oder dessen männliche Nachkommen der Nachfolger. Der Cacique guazú mit seiner Horde hat namentlich die Aufsicht über das nicht unbedeutende Pferdematerial unter sich. Die Lenguas haben im Laufe der Jahre durch Diebstahl und Tausch es zu einer ganz beträchtlichen Pferdeheerde gebracht. Die unermesslichen Weidegründe des Chacogebietes liefern Nahrung in Hülle und Fülle. Ganz geübt im Reiten, sind dieselben aber trotz allem nichts weniger als ein Reitervolk. Das Pferd wird von Ihnen mehr als Last- denn als Reitthier gebraucht. Auf allen ihren Zügen gehen sie zu Fuss, die Pferde an der Leine führend. Die Lenguas sind der zahlreichste Stamm der Chacobevölkerung. Ich schätze ihre Zahl über Tausend. Die Lenguas selbst—deren Zahlenbegriffe bei 4 aufhören, geben sie als noch viel mehr an —allerdings eine sehr unverlässige Angabe. Da nie mehr als 10-12 Horden zu gleicher Zeit sich im Toldo guazú befinden so ist eine Schätzung sehr schwer möglich, da die verschiedenen Horden sich über ein Gebiet von mehr als Tausend Quadratmeilen erstrecken. Die meisten Horden halten sich nur vorübergehend bei grossen Festlichkeiten, nach guten Jagderfolg, etc., im Toldo guazú auf, sonst streifen sie jagend in der Weite, überall da wo sie Jagd oder Fischbeute im grösserem Massstabe erwarten, primitive Hütten erbauend, wie ich sie by den Guanás weiter oben schon beschrieben habe. Die Lenguas sind der einzige Stamm unter den Chacostämmen, der etwas Ackerbau betreibt. Es ist allerdings eine Profanation des Wortes Ackerbau, wenn man das Pflanzen der Lenguas als solches bezeichnen will. An geeigneten Stellen brennen sie das Gras und Gestrüpp ab, machen mit ihren hölzernen Lanzen nach einem Regen ca. 5-7 cm. tiefe Löcher in den Boden, versenken in dieselben einige Kürbiss, Melonen oder Maissamen und überlassen nun das ganze dem wohlthätigen Einflusse der Mutter Natur ohne sich bis zur Erntezeit weiter darum zu bekümmern. Ist dieselbe da, dann kommen sie wieder zurück um einzuheimsen was die Papageien, Füchse, Rehe und Hirsche übrig ge-

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lassen. Von Ausjäten, Einfriedigen, etc., ist natürlich keine Rede. Das Resultat ist auch darnach.

Die Lenguas sind tüchtige, erfahrene Jäger, und Tausende von Hirschen müssen alljährlich ihre Unerfahrenheit, den mit Schilf und Binsen bedeckten, sich heranschleichenden Rothhäuten nicht auszuweichen, mit dem Leben bezahlen. Die Waffen, deren sie sich dabei bedienen, sind ein ca 1½ Meter langer, aus Palo de lanza verfertigter Bogen und ein 1—1.20 M. langes, an der Spitze mit einem lanzetförmigen Eisenstück versehener Pfeil, mit dem sie sehr sicher und genau schiessen. Kommt der Jäger nahe genug heran, so bedient er sich wohl auch des Boleadors, einer Waffe, die aus drei, circa 1½ Meter langen Seilen von Hirschhaut besteht, deren obere Enden mit einander verknüpft, und deren untere Enden mit schweren, kugelförmigen Steinen versehen sind. Ist der Boleador geschickt geworfen, bringt er den Hirschen zum Fall, und ein wohl berechneter Stoss mit der Lanze macht ihm den Garaus. Wird der Lengua auf der Jagd von einem Jaguar angefallen, so ist es auch die Lanze wieder, die er als Hauptvertheidigungswaffe gebraucht.

Der Vogeljagd ist der Lengua weniger zugeneigt, doch stellt er wohl ziemlich häufig den Straussen nach, deren gesuchte Schwanzfedern er dann gegen allerlei nützliches und unnützes an der Paraguayküste vorüberkommenden Schiffern austauscht. Der Fischfang wird hauptsächlich von den jungen Elementen des Stammes betrieben, die den grössten Theil des Tages in ihrem aus Trinhastämmen gebauten, mit Feuer ausgehöhlten Piroguen zubringen, jedem vorüberkommenden Schiff sich nähernd, um eventuell etwas erbetteln zu können. Die Leute sind durchwegs, sowohl Männer als Frauen, vorzügliche Schwimmer, und es ist interessant zuzusehen, wie eine ganze Horde mit Kindern und Gepäck einen ihren Weg kreuzenden Fluss passirt. Die kleinsten Kinder werden auf einem Floss untergebracht, das aus Bambusröhren, mit über denselben ausgespannten Fellen gebaut ist; dasselbe wird an einem Seile befestigt, das eine Frau in den Mund nimmt, und nun kreuzt dieselbe den Fluss. Auf dem andern Ufer angekommen, zieht sie nun langsam das mit Säuglingen und ganz kleinen Kindern beladene Floss an sich, zwei bis drei andere Frauen schwimmen neben und hin-

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ter demselben. Sollte einer der Sprösslinge herunterfallen, flugs ist er wieder aufgefischt und auf das Floss gelegt; die grösseren, d. h. drei- bis fünfjährigen Kinder, passiren den Fluss rittlings auf dem Nacken der Mutter.

Die Lenguas sind wie die übrigen Chacostämme Monogamisten. Mit eintretender Pubertät verheirathet sich der junge Mann, ohne besondern Prüfungen oder Formalitäten unterworfen zu werden; er holt sich ganz einfach bei einer Nachbarhorde eine der mobilen Schönen, bringt sie zu seinem Lager, wo von Verwandten und Hordengenossen ein höllischer mit dem Namen Gesang bezeichneter Lärm vollführt wird, der bis zum frühen Morgen dauert und die einzigen Hochzeitsfeierlichkeiten bildet. Die Lenguas haben im Allgemeinen das Einkindersystem eingeführt, auch einer der Gründe, die das allmähliche Aussterben der Rasse herherbeiführen. Im Falle von Krankheiten wenden dieselben alle möglichen Quack- und Sangproceduren an, ähnlich wie bei den Guanás, nur dass bei denselben alle älteren Leute Medicinmänner sind, und nicht eine eigene Kaste bilden wie bei den Guanás.

Stirbt einer der Lenguas, so wird er in seinen Wollenponcho in aufrecht kauernder Stellung verpackt und im freien Felde begraben, gewöhnlich nicht tief genug, so dass öfters hungrige Füchse den Leichnam blosslegen und verzehren.

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VILEN ALS HEILKUNDIGE IM VOLKGLAUBEN DER SUEDSLAVEN.

VON DR. FRIEDRICH S. KRAUSS.

VILEN sind Baumgeister oder Baumseelen ihrem Ursprunge nach, und in ausgereifter Gestalt Waldfrauen, Wald- und Flurengeister mit einem derart grossen Machtbezirk, dass man sie füglich als den lebendigsten und kräftigsten Ausdruck des südslavischen Volkglaubens in den Vordergrund jeder auf den Glauben der Südslaven bezüglichen Erörterung zu setzen bemüssigt ist. Wenn einmal der Vilenglaube in allen seinen Entwicklungs- und Erscheinungsformen klargelegt sein wird, so ist dann der grössere—und zugleich wichtigste—Theil des ursprünglichen Glaubens der südslavischen Völker, der südslavischen Mythologie—sofern man sich dieser gewohnten, doch nicht ganz zutreffenden Bezeichnung bedienen mag—für die Wissenschaft der Volk- und Völkerkunde endgiltig blossgelegt.

In meinem Buche „Volkglaube und religiöser Brauch der Südslaven," (vorwiegend nach eigenen Ermittelungen, Münster i. W. 1890) S. 57–109, wagte ich den Versuch den südslavischen Vilenglauben in seinen Grundzügen auseinanderzusetzen. Das wichtigste aus meinen umfangreichen Sammlungen südslavischer Volküberlieferungen fand darin seine Verwerthung. Was ich bis nun an weiteren Stoffen über Vilen aufbrachte, alterirt meine gedruckten Darlegungen nicht, ist jedoch nach *jeder* Richtung hin geignet, in wissenswerthen Einzelnheiten das Gewonnene zu bereichern, d. h. unsere Einsicht in die Materie zu vertiefen.

Von den Vilen in ihrer Eigenschaft als Heilkünstlerinnen oder Aerztinnen, bzw. als Lehrerinnen der volkthümlichen Heilkunde, handelte ich in meinen genannten Buche auf S. 100 ff. Dort wird auch der noch praktizirenden Zauberin Vaja in Koprivnica bei Pleternica (in der Pozegaer Gespannschaft in Slavonien) des breiteren gedacht, die sich für eine Schülerin der Vilen ausgiebt, für eine solche beim Volke auch wirklich

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gilt, und sich einer zauberärztlichen, zahlreichen Klientel erfreut. Ich habe für die Frau eine rege Theilnahme bewahrt, die übrigens auf Gegenseitigkeit beruht, wie ich ja bei meinen bäuerlichen Landleuten in der alten Heimath durchaus gut angeschrieben bin. (Die Bauern trugen mir gar ihre Vertretung für den kroatischen Landtag an, welche Ehre und Würde ich ablehnte, weil sie mit meiner mehr friedlichen, wissenschaftlichen Thätigkeit in keinem Einklange stände.) Im November v. J. (1892) liess ich durch meine in Pleternica wohnhafte Schwester der alten Vaja meinen Gruss entbieten und sie um weitere Mittheilungen betreffs der Vilen ersuchen. Die Antwort traf fast umgehend ein. Alles wäre beim alten geblieben, nur sei der Vaja eine neue Concurrentin erstanden, die Bäuerin Jula, die sich gleichfalls der Gunst der Vilen zu erfreuen beginne.

Den Brief schrieb ein erwachsenes Dorfmädchen. Während die älteren Leute noch illiterat sind, kann die jüngere Generation durchgehends lesen und schreiben. Das ist im Grossen und Ganzen der Vortheil eines vierjährigen Besuches der Volksschule, im übrigen bleibt der Bauer seinen überkommenen Sitten, Bräuchen und unchristlichen religiösen Anschauungen treu. Der Brief meiner Correspondentin ist natürlich unorthographish, die Darstellung zerrissen und sprunghaft und auch das eine Frauenhand verratende Postscriptum fehlt nicht. Der Brief verdient, abgesehen davon dass er uns ein neues authentisches Pröbchen wirklicher Volkssprache der Serben darbietet, seines lehrreichen Inhalts halber einen wörtlichen Abdruck mit einer fortlaufenden Zwischenzeilenverdeutschung nebst Erläuterungen. Angesichts des einfachen jeden Redeschmuckes baren Satzbaues, ist der Sinn der Rede, trotz der verschiedenen Wortstellungen im Deutschen, leicht verständlich, so dass von einer freien Verdeutschung, um Raum zu ersparen, ohne weiters Umgang genommen werden kann.

Zum Verständniss des Briefes schicke ich voraus, dass die Bewohner von Koprivnica ihrer Confession nach Katholiken, der Sprache nach Serben sind, und dass im Dorfe noch vorwiegend die Institution der Hausgemeinschaft zur Kraft besteht. Frau Julie, über die das Schreiben berichtet, ist eine hysterische Person die an Hallucinationen leidet und

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auch by ihren Leuten zuweilen für verrückt gehalten wird. Die Verrücktheit aber tritt nach dem Volksglauben jedesmal ein, wenn Vilen von einem Menschen Besitz nehmen. Die Hallucinationen Julien's stimmen folgerichtig mit den eingewurzelten Glaubensvorstellungen der übrigen Volksgenossen gleichen Bildunggrades vollkommen überein. Diese Erscheinung ist nicht vereinzelt. Im Jahre 1877, als ich noch Gymnasialschüler war, besuchte ich in den Ferien in Zagragje, drei Stunden von Pleternica gegen die Save zu, die Schmiedbäuerin, die in ihren Hallucinationen mit der Mutter Gottes Unterredungen pflog, und die Brandmale Christi an ihrem Leibe zeigte. Dieser Frau rentirte sich das Geschäft noch besser als der alten Vaja. Orthodoxe Priester der Serben meiner Heimath pflegen noch gegenwärtig an Festtagen vor den Kirchenthüren aus Kranken den Teufel durch Exorzismen zu bannen. Viele Bedauernswerthe, die an Wahnvorstellungen leiden oder thatsächlich wahnsinnig sind, gelten als vom Teufel oder Teufeln besessen und glauben auch selber daran.

(1) Jedna je vila na seljakinju Julu ljuta bila
Eine ist Vila auf Bäuerin Julie erzürnt gewesen,
sto joj nehotice dijete pogazila pa ju je uvijek
weil ihr unwillkührlich das Kind niedergetreten und sie ist immer
u glavu tukla, da se tesko razbolila. (2) U
in den Kopf geschlagen, dass sich schwer erkrankte. In
bolesti su k njojzi pet vili dolazile.
der Krankheit sind zu ihr fünf Vilen pflegten zu kommen.
(3) Ona rekla vili, zasto oni nju tucu a [ne]
Sie sprach zur Vila, warum sie sie schlagen aber [nicht]
koju drugu zenu u kući, a one su njoj rekle:
welches andere Weib im Hause, doch sie sind ihr gesagt:
"druge nijesu nama nista krive, da nje tucemo!"
"Andere nicht sind uns nichts schuld, dass sie wir schlagen!"
(4) Jula je njima rekla: "Nemojte mene vise tuć,
Julie ist ihnen gesagt: Lasst ab mich mehr zu schlagen,
ja ću se za vas Bogu molit!" (5) Druge cetir
ich werde mich für euch zu Gott beten!" Andere vier

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vile su onu vilu molili za Julu petu da ju vise
Vilen sind jene Vila gebeten für Julia die fünfte, dass sie mehr
ne tuce.
nicht schlage.

(6) One su sa Julom na jednoj postelji spavali.
Jene sind mit Julien auf einem Bette geschlafen.
(7) Kad bi Jula spavala onda zu i vile spavale,
So oft als Julia schlief dann sind auch die Vilen geschlafen,
a kat se je Jula probudila, onda su se i vile
und wann sich ist Julia erwacht, dann sind sich auch die Vilen
probudile. (8) Jula ji pitala, kako one zive. (9) One
erwacht. Julia sie fragte, wie sie leben. Sie
su joj kazala: "Mi bi dobro zivile; da nas vuci
sind ihr gesagt: "Wir würden gut leben; wenn uns die Wölfe
ne rastrgaju u gori, nas bi vise bilo nego
nicht zerrissen im Hochgebirge, unserer würde mehr sein als
drugog svijeta." (10) Jula im rekla: "a zasto se vi
anderer Welt (Leute)." Julia ihnen sagte: "Aber warum sich ihr
ne sakrijete od vuka, da on vas ne moze najći?"
nicht versteckt vor dem Wolfe, dass er euch nicht kann finden?"
(11) One su njoj na to odgovorile, da se one najbolje
Sie sind ihr auf dies geantwortet, dass sich sie am besten
mozu, kad ljudi skale tesu i skalotes ostave
mehren, wann Männer Balken behauen und den Holzabfall liegen lassen
i ne presijecu ga. (12) Tu ji vuk ne vidi.
und nicht durchhacken ihn. Da sie der Wolf nicht sieht.
(13) One svakoga covjeka blagosivljaju, koji skalotes ne
Sie jeden Menschen segnen, der Holzabfälle nicht
presijece.
durchhackt.

(14) To je tako glasno s Julom pripovijedanje
Dies ist so laut mit Julien Erzählung
bilo, konda, je ji bilo dvajestero u sobi.
gewesen, als ob ist ihrer gewesen an zwanzig in der Stube.
(15) Svijet se je kupio pot proror pa sluso Julu
Die Leute sich sind gesammelt unter das Fenster und hörte zu Julien
i vile kako se razovaraju. (16) Osim Jule nije
und den Vilen, wie sich unterreden. Ausser Julien nicht ist
vile nitko mogo viditi. (17) I vracare Vaje vile
die Vilen niemand gekonnt sehen. Und der Heilkünstlerin Vaja Vilen

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dojdu cesće vraćari Vaji u pohode i stogod
kommen öfters zur Heilkünstlerin Vaja in die Besuche und was immer
će bit, to oni njoje kazu, i koliko će bolesnika
wird sein, das sie ihr sagen, und wieviel werden Kranke
kakove bolest koji ima i kakvima travama i
was für Krankheit wer hat und mit was für Kräutern und
da ji lijeci, oni njoj sve kazu.
dass sie [sie] heile, sie ihr alles sagen.

(18) Vile su velo lijepe samo imaju volo mali
Vilen sind sehr schön nur haben sie sehr kleine
nos.
Nase.

(19) Kad je bila bolestna onda je uvik ludila,
Als ist sie gewesen krank dann ist immer sie närrisch ge-
uvik je Anu Vasebojcić krivila, da se je ona
wesen, immer ist Anna Vasebojcic beschuldigt, dass sich ist sie
pretvorila u vilu pa da je nju tukla. (20) Jednu
verwandelt in eine Vile und dass ist sie geschlagen. Eine
noć je doslo pet vila k njoje. (21) Onda su joj ka-
Nacht ist gekommen fünf Vilen zu ihr. Dann sind ihr ge-
zale: "Julo ajde ti s nama pa ćems ti kazati
sagt: "Julia, komm du mit uns und wir werden dir sagen
znanje svakako." (22) "Ja ću ići s vama, ako mi
Wissenschaft allerlei." "Ich werde gehen mit euch, wenn mir
pokazete vracati, ko sto ste ucili majstoricu."
zeigt Heilkunst auszuüben, wie was seid gelehrt die Handwerkerfrau."
(23) One su njoj kazale: "Kako bi mi tebe ucili?
Sie sind ihr gesagt: "Wie würden wir dich lehren?
Mi nismo ucili ni majstoricu već nase
Wir nicht sind gelehrt, auch nicht die Handwerkerfrau, sondern unsere
strine i tetke."
Muhmen und Tanten."

(24) Ona se jednu vecer obukla i obukla
Sie sich eines Abends angekleidet und angezogen
kudmen i opanke. (25) Onda ju pitala druzina: "Julo
Lodenrock und Topanken. Dann sie gefragt das Gesinde: "Julia,
kut ćes sada?" a ona kaze: "zovu me vile, da
wohin wirst jetzt?" und sie sagt: "Sie rufen mich die Vilen, dass
idem s njima il da idem il da ću izgubit
ich gehe mit ihnen, entweder dass ich gehe oder dass ich werde verlieren

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glavu.". (26) Onda je dosla ka svekrvi u brdo
das Haupt." Dann ist gekommen zur Schwiegermutter ins Gebirge
pa je kazala: "vi mene pricekajte, ja idem svoju
und ist gesagt: "Ihr mich erwartet, ich gehe meine
Maru prigledat" a vile su njoj kazale: "sad ajde
Marie besuchen" und die Vilen sind ihr gesagt: "Jetzt geh
s nama u sumu a kat se vratis kući, onda
mit uns in den Wald und wann dich zurückkehrt heim, dann
idi k svojoj Mari.' (27) Kad je dosla u sumu onda
geh zu deiner Marie." Als ist gekommen in den Wald, dann
je s njima stajala pod bukvom a k njoj su
ist mit ihnen gestanden unter Buche und zu ihr sind
dosle njezina mama, svekrva i majstorica
gekommen ihre Mutter, Schwiegermutter und Handwerkerfrau
Vaja, pa su je zvale, da ide s njima kući.
Vaja, und sind sie gerufen, dass sie gehe mit ihnen heim.
(28) "Idite vi kuć, one kazu. (29) Ako vi ne budete
"Gehet Ihr heim, sie sagen. Wenn Ihr nicht werdet
isle kuć da će mene jos preko većih brda vući
gegangen heim, dass werden mich noch über grössere Berge schleppen
i da će mene jos gorje tući." (30) One su otisle
und dass werden mich noch ärger schlagen." Jene sind gegangen
kući a vile su nju odvele u vinograde.
heim aber die Vilen sind sie weggeführt in die Weinberge.
(31) Onda su je tile odvest na Seoce a ona je
Dann sind sie gewollt wegführen auf Seoce aber sie ist
njima kazala: "nemojte, ako znate za Boga, već
ihnen gesagt: "Lasst ab, wenn Ihr wisst um Gott, schon
me jako bole noge a već će skoro biti mrak."
mich sehr schmerzen die Füsse und schon wird bald sein Dunkel-
(32) Onda su joj dale tri trave: cubar, bujad i
heit." Dann sind ihr gegeben drei Kräuter: Saturei, Farrenkraut und
streljanu pa su joj kazale: "Kad bude do zore
Pfeilwurz und sind ihr gesagt: "Wann wird sein bis zur Morgenröthe
dva sata onda nek te majstorica Vaja kupa u
zwei Stunden, dann soll dich die Handwerkerfrau Vaja baden in
toj travi i nek donese sa luke vode." (33) A
diesem Kraute und soll herbeibringen vom Hain Wasser." Aber
ona je njima kazala: "Otkale vi znadete za taj
sie ist ihnen gesagt: "Von wannen Ihr wisst um diesen

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bunar?" (34) "Kako mi ne bi znale za taj bunar,
Brunnen?" "Wie wir nicht würden wissen um diesen Brunnen,
kat se mi uvik tud kupamo i cesljamo?'
wann uns wir immer dort baden und kämmen?"
(35) Ona je njima kazala: "Joj, kako me bole ruke!"
Sie ist ihnen gesagt: "Wehe, wie mich schmerzen die Hän-
(36) Kako te ne bi bolile ruke, kat ti je
de! Wie dich nicht würden schmerzen die Hände, wann dir ist
mama na ruke metala pijavice!" (37) "Kako vi
die Mutter auf die Hände gelegt Blutegel?" "Wie Ihr
znate [moju mater?" (38) "Kako mi ne bi
wisst (kennt) meine Mutter?" "Wie wir nicht würden
znale tvoju mater, na vrh je sela; zove se
kennen deine Mutter; an der Spitze ist des Dorfes; sie heisst sich
Janja. (39) Mi uvik dojdemo k njoj u sobu
Janja. Wir immer pflegen zu kommen zu ihr in die Stube
pa se kot peći grijemo."
und uns bei dem Ofen wärmen."

(40) Onda kad je Jula već malo ozdravila, one
Darauf als ist Julie schon ein wenig genesen, sie
su dosle k njoje pa su joj kazale: (41) "Ajde Julo s
sind gekommen zu ihr und sind ihr gesagt: "Komm Julie mit
nama k majstorici Vaji!" (42) Kat su dosli k Vaji
uns zur Handwerkerfrau Vaja!" Als sind gekommen zur Vaja
a ona nije bila kot kuće a one njoj kazu:
aber sie nicht ist gewesen zu Hause und jene ihr sagen:
(43) "Vaja je valjda kot tvoje strine Stane; ona je
"Vaja ist wahrscheinlich bei deiner Muhme Stana; die ist
na umoru." (44) Vile su se zvale: jednoj je bilo
im Sterben." Die Vilen sind sich geheissen: der einen ist gewesen
ime Kata, drugoj Manda, trećoj Jela,
der Name Katharine, der anderen Magdalene, der dritten Helene,
cetvrtoj Jula a petoj Ana.
der vierten Julie und der fünften Anna.

(45) Vaja je meni pripovidala, kako su nju vile u
Vaja ist mir erzählt, wie sind sie die Vilen in
sumu vodile i nju ucile svijet lijecit. (46) Zato
den Wald geführt und sie gelehrt die Leute zu heilen. Darum

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ona za vile Bogu se molit mora, da im [se]
sie für die Vilen zu Gott sich beten muss, dass ihnen [sich]
nikako zlo dogodit [ne] more.
keinerlei Uebel zutragen [nicht] könne.

Erläuterungen.

Zu Satz 1. Vergl. *Krauss:* Volksglaube und religiöser Brauch der Südslaven, p. 72, 82.

" " 2. Ausnahmsweise ihrer fünf, sonst nur drei. Vergl. a. a. O. S. 82.

" " 4. Diese *Captatio benevolentiae* geht darauf zurück, dass man in *neuerer* Zeit die Vilen für gottverlassene Geister ansieht, auf denen ein Bann ruht, der durch Gebete wie für's Seelenheil Verstorbener behoben werden könne.

Zu Satz 5. Richtig grammatisch und logisch: *onu pelu vilu.* Die auffällige Wortstellung nur für's Auge; denn die Erzählerin hilft mit Geberdenspiel nach und hebt das Wort *pelu* mit besonderem Nachdruck hervor.

Zu Satz 6. Die Vilen sind Julien nicht in den Leib gefahren, sonst wäre sie völlig wahnsinnig geworden. Sie behelligen sie bloss durch ihre leidige Gegenwart und versäumen für das Leben.

Zu Satz 8 u. 9. Die Frage wirft Julie nicht etwa aus folkloristischer Wissbegierde auf, sondern gewohnheitsmässig, wie man sonst Jemand bei der Begegnung frägt: 'Wie gehts dir? Was machst du? Wie lebst du?' Die Antwort der Vilen stimmt mit der Mittheilung im 'Volksglauben' a. a. O. S. 108 überein. Bemerkenswerth ist jedoch, dass es Vilen lieben, sich zuweilen in Wölfe zu verwandeln. Bei den Südslaven bedeuten Wölfe einen bösen Ausgang, entgegen dem deutschen Volksglauben; vergl. z. B. *Rud. Reichel* in der Zeitschrift f. d. deutschen Unterricht, 7. Jahrg. S. 500: 'Zum Angang des Wolfes.' Ferner *Dr. L. Hopf:* 'Thierorakel und Orakelthiere.' Stuttg. 1888, S. 32. Ueber den Wolf als den Feind *schwedischer* Waldgeister vergl. *W. Mannhardt:* "Der Baumkultus der Germanen und ihre Nachbarstämme." Berlin 1875, S. 135, wo eine Skogsrå mit ihren Kindern von Wölfen zerfleischt wird.

Svijet hier wie das lat. *mundus*, sowohl für 'Leute' als für 'Welt', mit Bezug auf Menschen. *Narod* (Volk) wäre in dieser Verbindung unstatthaft; denn auch die Vilen sind in ihrer Art ein Volk nach dem Begriffe der Bauern.

Zu Satz 11 u. 12. Die Frage Juliens bleibt nach der Antwort der Vilen noch immer offen für den Bauer, für uns nicht. Die Wölfe sind eben mächtigere Waldgeister als die zartgebauten Waldfräulein. Der Zag, dass die Vilen in den nicht kleingeschlagenen Holzabfällen (der Rinde vor allem) Schutz und Zuflucht vor ihren Verfolgern finden, ist *neu* für den südslavischen Volksglauben, soweit ich ihn bei der Abfassung meines obgedachten Buches kannte, doch der Sache nach gewiss *ursprünglich* und alt. Wenn der Baum auch gefällt ist, so kann der Dämon im Stumpfen, den Wurzeln und der Baumrinde, die bei der Daubenverfertigung in Wegfall kommt, sein Leben weiterfristen; denn das *Kleid* bleibt ihm erhalten. Höchst zutreffende Parallelen hiefür bietet *Mannhardt* a. a. O. S. 83 ff. Wenn sich die Vilen in ihr Gehäuse wieder zurückziehen, werden sie für den Wolf natürlich unsichtbar.

Zu Satz 13. Das Segnen der Wohlthäter ganz wie im germanischen Volksglauben. Vergl. *Mannhardt* a. a. O.

Zu Satz 14. Julie spricht selbstverständlich auch für die Vilen mit verstellter Stimme, einer sog. Bauchstimme. Die tobsüchtige Julie weilt allein in der abgesperrten Stube und unter Grauen und Beben horchen unterm Fenster kauernd die Leute dem wilden Geschrei, das aus dem Hause herausdringt.

Zu Satz 17 u. 18. Zwei zur Erläuterung eingeschobene Sätze. Wir würden nach unserer Auffassung uns so vielleicht ausdrücken: "Auch Vaja bekömmt zu Zeiten ihre bösen hysterischen Krämpfe und Anfälle unter sonambulen (hellseherischen) Erscheinungen, die eine entsprechende Deutung erfahren."

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Der Mittelsatz müsste logisch und grammatisch korrekt lauten: "I koliko će bolesnika biti i kakove će bolesti ko imati," u. s. w. Die hier gerügte Sprachschlamperei ist während des Vortrages einer lebhaft gestikulirenden Erzählerin unanstössig. Wir thäten Unrecht, wollten wir unsere Bücherdiction zum Massstabe bei der Beurtheilung echt volksthümlicher Schilderungweise nehmen. Unsere Regelmässigkeit im Ausdruck und Satzbau ist bloss das Ergebniss seiner langen Schulung, sozusagen die zur Regel erhobene Ausnahme der schönen Erzählungsweise des Ungebildeten.

Die Krankheiten entstehen durch den Einfluss der "bösen Winde" und der Waldgeister. Darum können Vilen gerade in diesem Falle richtig prophezeien und die Gegenmittel namhaft machen.

Zu Satz 18. Eine kleine Nase ist nach den Schönheitsbegriffen der Südslavinnen ein Vorzug. In den zahllosen typischen Schilderungen der Frauenschönheit (im Guslarenliede) ist *niemals* von der Nase die Rede. Die nach dem Volksglauben als ein Frauenzimmer umherstrolchende Pest (Kuga) hat eine auffällig spitze Nase und ein aufgerissenes Maul. Ein schönes Weib zeichnet sich dagegen durch ein (Stumpf-) Näschen und ein kleines Mündchen aus.

Zu Satz 19. Ana Vasebojčić, richtiger: Ana Vase Bojčića — Anna des Basilius Bojčić, zum Unterschied einer anderen Anna aus der Sippe Bojčić im selben Dorfe. Dass sich gewisse Frauenzimmer zu Vilen, bezw. Hexen oder auch Wärwölfe verwandeln können und umgekehrt, ist als ein internationaler Glaube wohl bekannt. Ein solcher Verdacht ist mitunter für den Betroffenen verhängnissvoll. Vgl. *Krauss*, Volksglaube u. s. w., S. 121.

Zu Satz 21. Unter allerlei Wissenschaft ist Zauber und Wahrsagekunst nebst Heilkunde zu verstehen. Julie aber will vornehmlich die nutzbringende Heilkunde erlernen. Die "Majstorica" (Meisterin), d. h. Handwerkerfrau, ist die Jüngerin anderer Vilen als der Quälgeister Juliens. Die Bezeichnung "Muhmen und Tanten" neueren Ursprungs, denn alle Vilen sind "Schwestern."

Zu Satz 24. Für gewöhnlich geht im Dorfe die Bäuerin barfuss, mit Hemd und weissem Leinenkittel bekleidet, herum. Dass Julie den Lodenrock und die Opanken anlegt, zeigt den Leuten, dass sie die Absicht habe, ausser Dorfes zu gehen.

Zu Satz 26. Die Schwiegermutter hält sich im Gebirge im Meierhofe der Hausgemeinschaft auf. Sie nennt ihre Schwieger einfach beim Namen "Marie."

Zu Satz 27. Die drei Frauen waren Julien gefolgt, um sie wieder heimzugeleiten; da sie aber nicht gutwillig mit will, lassen sie sie in Frieden, um bei den Vilen keinen Anstoss zu erregen.

Zu Satz 28. "Sie sagen," die Vilen nämlich, durch den Mund Juliens.

" " *31.* "Seoce" (Dörfchen), Name eines derzeit ziemlich grossen Dorfes im Pozegaer Gebirge, von Koprivnica zwei bis drei Stunden entfernt.

Zu Satz 34. Der Brunnen im Hain oberhalb Koprivnica ist also ein Vilenbrunnen, und sein Wasser vor Sonnenaufgang heilkräftig, nachdem Nachts Vilen darin gebadet haben.

Zu Satz 36. Juliens Mutter ist eben zur Wartung Juliens nach Koprivnica (aus Pleternica) gekommen und hat der Tochter Blutegel angesetzt. Blutegel sind noch immer ein beliebtes Universalmittel gegen Krankheiten.

Zu Satz 39. Ein richtig erfasster Zug der Waldgeister. International. *Mannhardt* a. a. O, S. 81. Anm.: "Der Dämon der Vegetation erweitert sich zum Genius des Wachsthums überhaupt, und zieht sich im Herbst, wenn der Sturm das Moos- und Blätterkleid der Bäume zerreisst, in Hof und Haus des Landmanns zurück, um hier als segnender Hausgeist für Gedeihen und Wachsthum zu wirken; er kehrt zu Wald und Flur zurück, sobald er im Frühling ein neues Gewand bekommt und seine Pfleglinge, die Thiere, wieder im Freien ihren Aufenthalt nehmen."

Zu Satz 44. Ueber Vilennamen siehe *Krauss* a. a. O., S. 70.

Zu Satz 45 u. 46. Sind das Postscriptum der Berichterstatterin.

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